IMPORTANT

Before you remove the Wire-Seal, check the contents of this envelope with the listing on the front of the envelope. If any part is missing, your Howard W. Sams distributor will replace the entire PHOTOFACT set IF the Wire-Seal has not been damaged.

This PHOTOFACT Folder Set is

WIRE-SEALED FOR YOUR PROTECTION

to guarantee completeness of contents

DO NOT ACCEPT IF SEAL HAS BEEN BROKEN

TO OPEN ***JUST DO THIS:***

1

Take hold of the Set with both hands. Place your thumbs directly under the top wire-seal; then, divide the contents equally by putting your thumbs midway through the thickness of the Set. Now, pull the two sections apart at the top, firmly.

2

Repeat this process, pulling close to the wire-seal at the bottom, so that the set is now divided into two equal parts.

3

Continue this "pulling-apart" process with the section in which the wire-seals remain, dividing it in half.

4

Finally, remove the wire-seals left in the last section; this can easily be done with your fingernail or any sharp instrument.

Your "Safety-Sealed" PHOTOFACT Set is now ready for profit-making use . . .

IMPORTANT

Before you remove the Wire-Seal, check the contents of this envelope with the listing on the front of the envelope. If any part is missing, your Howard W. Sams distributor will replace the entire PHOTOFACT set IF the Wire-Seal has not been damaged.

The PHOTOFACT® Servicer

SET 485 ★ *Published for all users of Howard W. Sams' Photofact Folders* ★ MAY 1960

CONTENTS PHOTOFACT SET 485

TRADE NAME AND MODEL	SET AND FOLDER NO.
TELEVISION RECEIVERS	
OLYMPIC CA205, U, KA215, U, KA217, U, TAY199, U, TA200, U (Ch. JA, JAU, 129) Tel Rec.	485-1
WESTINGHOUSE H-P3200, U, H-P3300, U, H-P3301, U (Ch. V-2384-1, V-2384-2) Tel. Rec.	485-2
OTHER EQUIPMENT	
ARVIN 2598 (Ch. 1.47900)	485-3
ARVIN 9598 (Ch. 1.47700)	485-4
AUTOMATIC D-2, D-8, DP-6, DP-11, H-4, H-9, HP-10, HP-15, VP-12, W-76, WP-4, WP-7, WP-7G, WPC-8	485-5
CHANNEL MASTER 6512, 6514	485-6
CURTIS MATHES 49MD, 59MD, 69MD, 149MD, 159MD, 169MD (Ch. 9)	485-7
EICO HF-50, HF-60	485-8
EMUD 186, 196	485-9
GENERAL ELECTRIC P780A, B	485-10
HITACHI WH-822, WH-822M	485-11
LESA LCS1-SA, 57-SA	485-12
MACO T-16	485-13
MINUTE MAN 6T-170	485-14
SILVERTONE 65, 66, 67 (Ch. 528.53550, 528.59430)	485-15
SILVERTONE 222 (Ch. 528.53680)	485-16
TOSHIBA 8TM-300S	485-17
ZENITH C835E, H, R, W, C845L, M, W, Y (Ch. 8C01, 8C02)	485-18

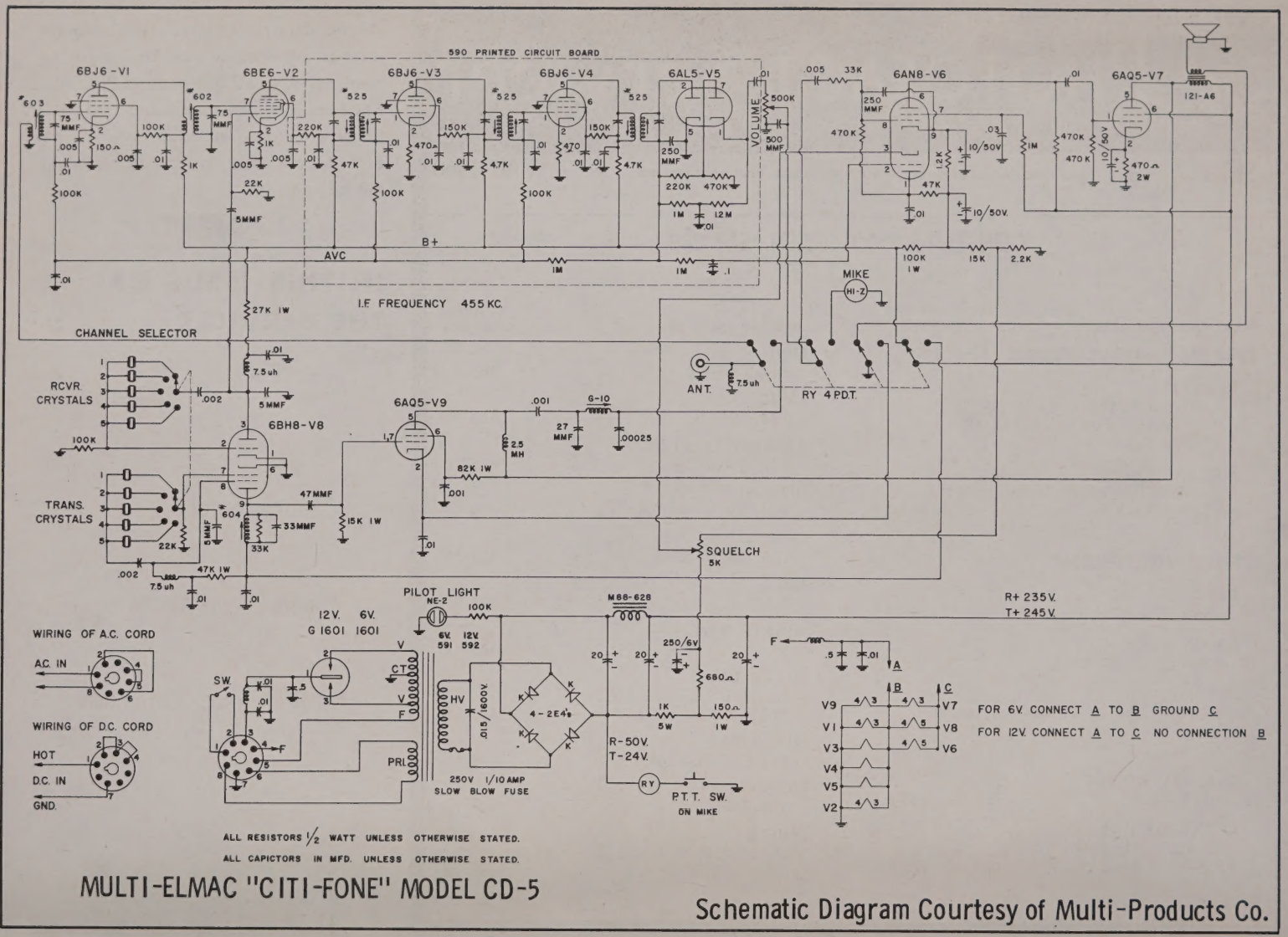
This Servicer provides you with essential data on other models or special equipment not covered in standard PHOTOFACT folders. The schematics and supplementary data included here will be of valuable help to you in servicing this equipment.

IN THIS ISSUE OF THE SERVICER:

Capitol Model 752

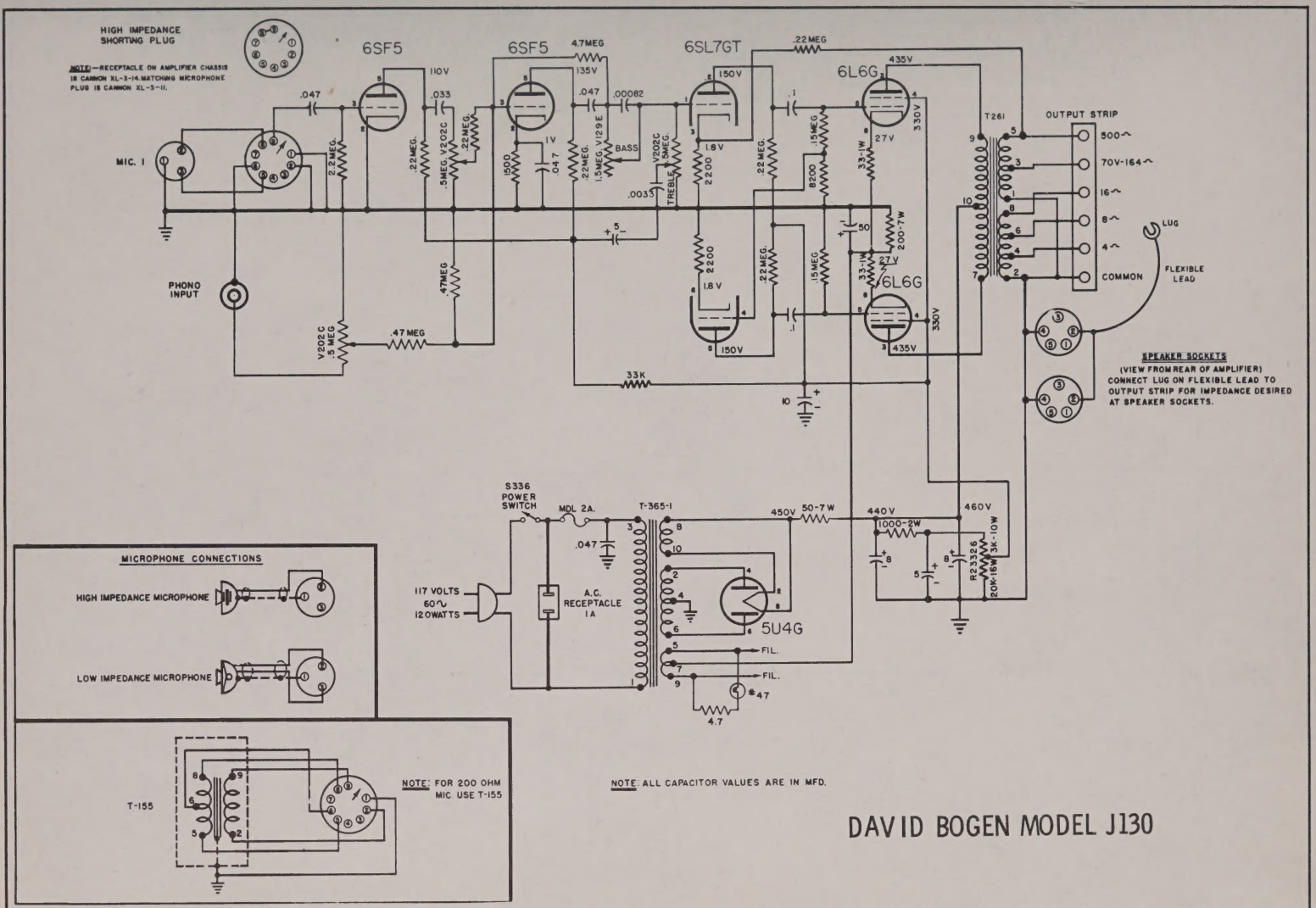
David Bogen Model J130

Multi-Elmac "Citi-Fone Model CD-5



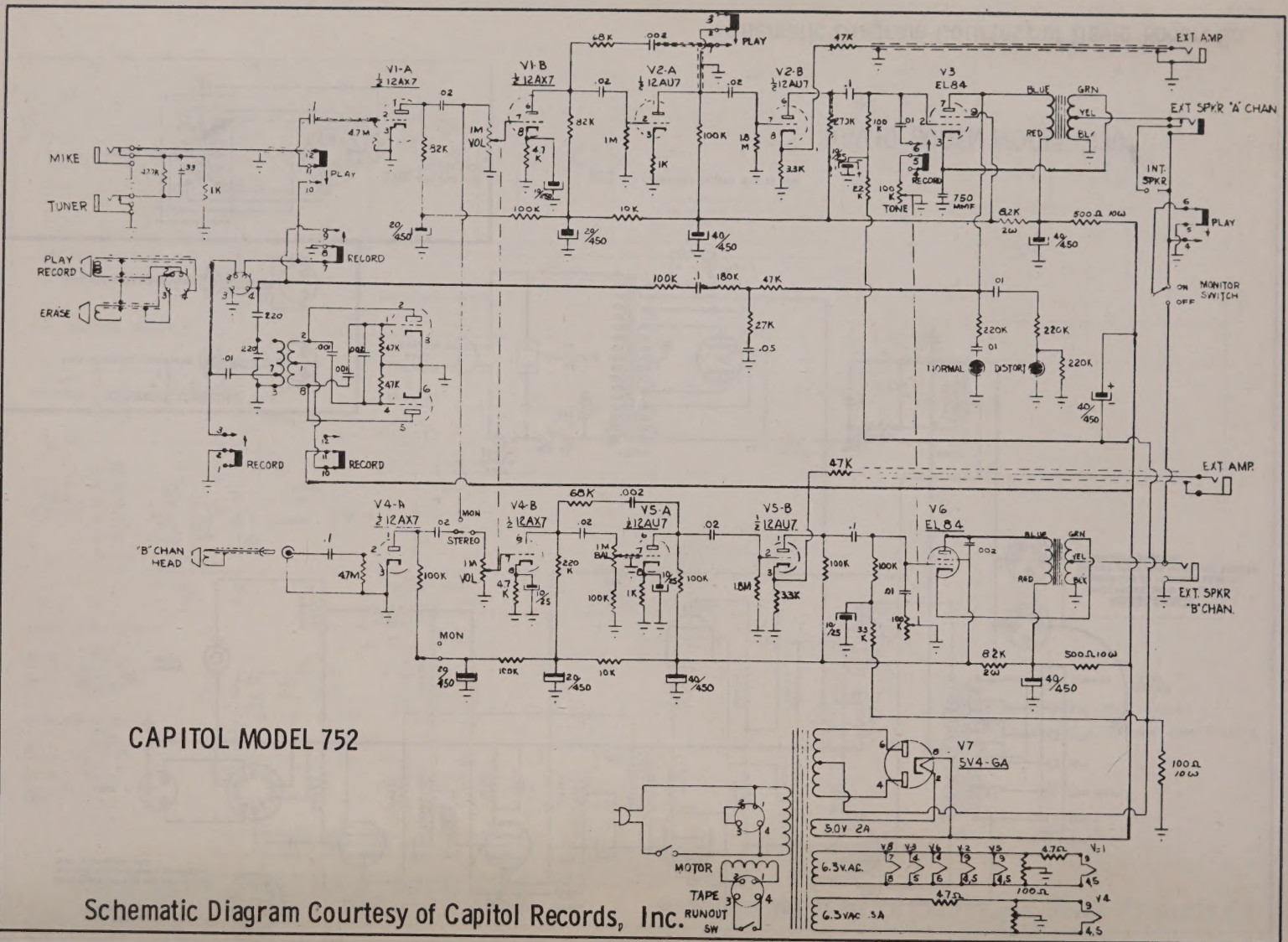
MULTI-ELMAC "CITI-FONE" MODEL CD-5

Schematic Diagram Courtesy of Multi-Products Co.



DAVID BOGEN MODEL J130

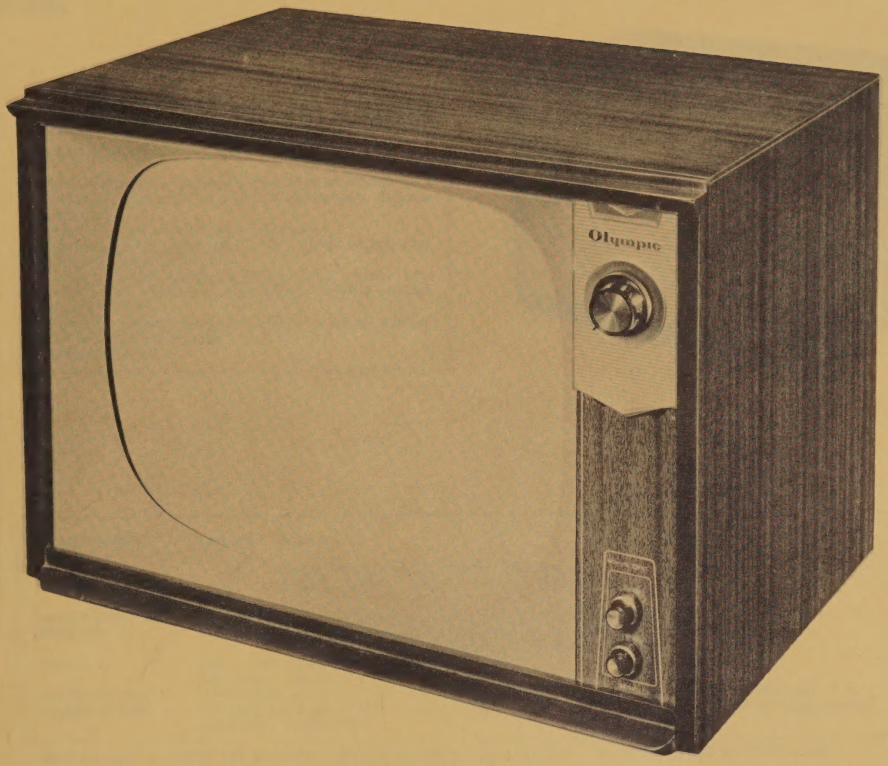
Schematic Diagram Courtesy of David Bogen Co.


CAPITOL MODEL 752
V1-A ½ 12AX7
V1-B ½ 12AX7
V2-A ½ 12AU7
V2-B ½ 12AU7
V3 EL84
V4-A ½ 12AX7
V4-B ½ 12AX7
V5-A ½ 12AU7
V5-B ½ 12AU7
V6 EL84
V7 5V4-GA
MIKE
TUNER
"B" CHAN HEAD
PLAY
RECORD
ERASE
STEREO
MON
TONE
NORMAL
DISTORT
EXT AMP
EXT SPKR "A" CHAN
INT. SPKR
MONITOR SWITCH
ON
OFF
EXT SPKR "B" CHAN.
MOTOR
TAPE RUNOUT SW
5.0V 2A
6.3V.A.C.
6.3VAC 1.5A
Schematic Diagram Courtesy of Capitol Records, Inc.

PHOTOFACT® Folder

OLYMPIC MODELS CA205, U, KA215, U, KA217, U, TAY199, U, TA200, U (Ch. JA, JAU, 129)

OLYMPIC MODELS CA205, U, KA215, U, KA217, U, TAY199, U, TA200, U (Ch. JA, JAU, 129)



MODEL TA-200 (Ch. JA)

OLYMPIC MODELS CA205, U, KA215, U, KA217, U, TAY199, U, TA200, U (Ch. JA, JAU, 129)

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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PHOTOFACT® Folder

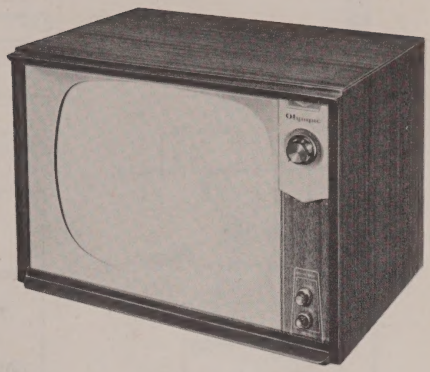
OLYMPIC MODELS CA205, U, KA215, U, KA217, U, TAY199, U, TA200, U (Ch. JA, JAU, 129)

OLYMPIC MODELS CA205, U, KA215, U, KA217, U, TAY199, U, TA200, U (Ch. JA, JAU, 129)

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL:

1. Remove 5 push-on type knobs from front of cabinet.
2. Remove 1 wood screw holding front escutcheon. Remove escutcheon.
3. Remove 2 push-on type knobs now visible.
4. Remove 1 wood screw and 1 metal screw holding rear cover. Remove rear cover.
5. Remove speaker leads, hi voltage lead, picture tube socket, yoke plug, and picture tube mounting bracket grounding wire.
6. Remove 3 chassis bolts from bottom of cabinet and one bolt from rear of chassis.
7. Remove chassis.



MODEL TA-200 (Ch. JA)

TRADE NAME	Olympic	Models — Chassis
		CA205, KA215, KA217, TA200, TAY199 ..... JA CA205U, KA215U, KA217U, TA200U, TAY199U ..... JAU
MANUFACTURER	Olympic Radio & Television Inc., 34-01 38th Ave., Long Island City 1, N. Y.	
TYPE SET	Television Receiver (Models KA215, U & TAY199, U with AM Tuner Ch. 129 and 4 Speed Automatic Record Changer)	
TUBES	TV: VHF - Fifteen, UHF - Sixteen AM Tuner: Two	
POWER SUPPLY	110-120 Volts AC, 60 Cycles RATING TV: 150 Watts, 1.35 Amp. @ 117 Volts AC	
TUNING RANGE	TV: Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier) AM Tuner: 540-1620KC	

MODELS KA215 & KA215U USE RECORD CHANGER OLYMPIC PART #RX25907. MODELS TAY199 & TAY199U USE RECORD CHANGER OLYMPIC PART #RX26202-1.

SERVICING IN THE FIELD

SAFETY GLASS REMOVAL

Remove 2 push-on type knobs from the front. Remove 5 screws holding trim. Tilt glass out and remove.

FUSE

One fuse is used for Horiz. Sweep Circuit protection. (See Tube Placement Chart). One fuse wire is used for filament protection and one fuse wire for LV Power Supply protection. (See M3 & M4, "Chassis Bottom View").

TUNER OSCILLATOR ADJUSTMENTS

To touch-up the VHF Oscillator, remove Channel Selector and Fine Tuning knobs.

AGC

The AGC may be varied by means of a Local-Distant switch. (For location, see "Tube Placement Chart".)

FOCUS

The focus may be varied by the position of a strap on the base of the picture tube.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENTS

Coarse adjustment of the Horizontal Hold is accomplished by the proper setting of the Horizontal Frequency slug. (For location, see "Tube Placement Chart".)

HORIZONTAL DRIVE

The horizontal drive may be varied by a Horizontal Size Trimmer. (For location, see "Tube Placement Chart".)

BUZZ ADJUSTMENT

To eliminate intercarrier buzz, adjust the Clarifier adjustment (Quadrature Coil) for MINIMUM buzz and maximum sound. (For location, see "Tube Placement Chart".)

CENTERING

Centering is accomplished by 2 magnetic rings, located behind the yoke, on the neck of the picture tube.

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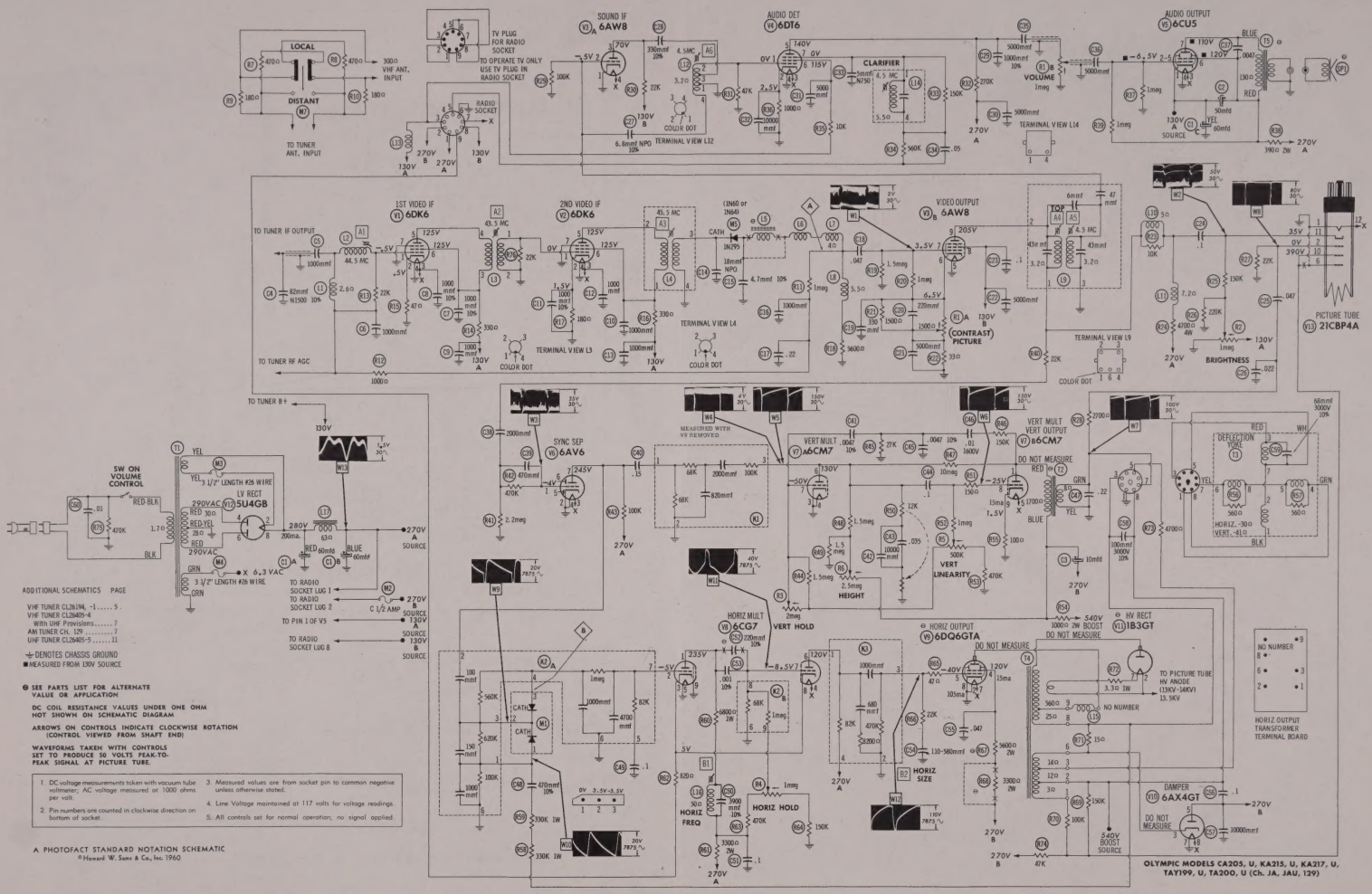
SET 485 FOLDER 1


LOCAL
DISTANT
TO TUNER ANT. INPUT
300Ω VHF ANT. INPUT
TV PLUG FOR RADIO SOCKET
TO OPERATE TV ONLY USE TV PLUG IN RADIO SOCKET
RADIO SOCKET
SOUND IF V2A 6AW8
AUDIO DET V4 6DT6
AUDIO OUTPUT V5 6CU5
CLARIFIER
VOLUME
TERMINAL VIEW L12
TERMINAL VIEW L14
1ST VIDEO IF V1 6DK6
2ND VIDEO IF V2 6DK6
VIDEO OUTPUT V3B 6AW8
TO TUNER IF OUTPUT
TO TUNER RF AGC
TERMINAL VIEW L3
TERMINAL VIEW L4
TERMINAL VIEW L9
COLOR DOT
CONTRAST PICTURE
BRIGHTNESS
PICTURE TUBE V13 21CBP4A
TO TUNER B+
SW ON VOLUME CONTROL
LV RECT V12 5U4GB
290VAC RED
290VAC RED-YEL
6.3 VAC
SYNC SEP V6 6AV6
VERT MULT V7A 6CM7
VERT MULT V7B 6CM7
VERT OUTPUT V7 6CM7
DO NOT MEASURE
VERT LINEARITY
VERT HOLD
HEIGHT
DEFLECTION YOKE
HORIZ MULT V8 6CG7
HORIZ OUTPUT V9 6DQ6GTA
HV RECT V11 1B3GT
TO PICTURE TUBE HV ANODE (13KV-14KV)
13.5KV
NO NUMBER
HORIZ OUTPUT TRANSFORMER TERMINAL BOARD
HORIZ FREQ
HORIZ HOLD
HORIZ SIZE
DAMPER V10 6AX4GT
540V BOOST SOURCE
TO RADIO SOCKET LUG 1
TO RADIO SOCKET LUG 2
TO PIN 1 OF V5
TO RADIO SOCKET LUG 8
C 1/2 AMP
ADDITIONAL SCHEMATICS PAGE
VHF TUNER CL26194, -1 5
VHF TUNER CL26405-4 With UHF Provisions 7
AM TUNER CH. 129 7
UHF TUNER CL26405-5 11
⏚ DENOTES CHASSIS GROUND
■ MEASURED FROM 130V SOURCE
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)
WAVEFORMS TAKEN WITH CONTROLS SET TO PRODUCE 50 VOLTS PEAK-TO-PEAK SIGMAL AT PICTURE TUBE.
1. DC voltage measurements taken with vacuum tube voltmeter; AC voltage measured or 1000 ohms per volt.
2. Pin numbers are counted in clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line Voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation; no signal applied.
A PHOTOFACT STANDARD NOTATION SCHEMATIC
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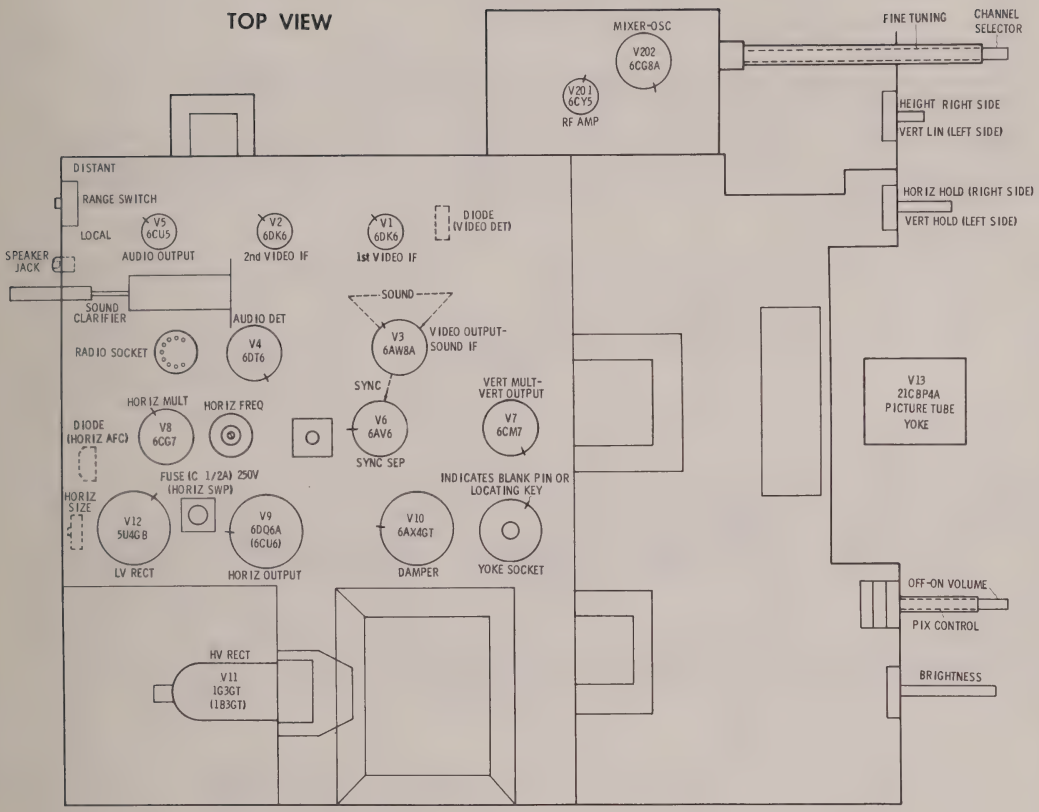
OLYMPIC MODELS CA205, U, KA215, U, KA217, U, TAY199, U, TA200, U (Ch. JA, JAU, 129)

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound Fuse Wire (LV Power), Fuse Wire (Fil), V12

SWEEP FAILURE
No raster, has sound V8, V9, V10, V11, V13, Fuse (Swp)
No vertical deflection V7
Poor vert. linearity or foldover V7
Poor horiz. linearity or foldover V8, V9, V10
Narrow picture V8, V9, V10, V12
Vert. off freq. V7
Horiz. off freq. Diode (Horiz. AFC), V8

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster V1, V2, Diode (Video Det.), V3
No pic, no sound, has snow V201, V202
No pic, has sound, has raster V3, V13
Has pic, no sound V3, V4, V5

SYNC FAILURE
No vert. sync V6
No horiz. sync V6, Diode (AFC)
No vert. or horiz. sync V6

T V ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

The High Voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested Alignment Tools: Mixer Plate Coil ..... GENERAL CEMENT #9296, 9297
WALSCO #2546, 2547
Al thru A5 ..... GENERAL CEMENT #8282, 8606, 8606L, 9295
WALSCO #2526, 2543, 2544, 2545
A6 ..... GENERAL CEMENT #8721, 8722
WALSCO #2519

VIDEO IF ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Direct	Place a thin insulated metal strip between the Mixer-Osc. tube and tube shield. Connect the high side of sweep generator to the metal strip. Low side to chassis.	Not used	44.5MC (Unmod.)	Any non-interfering channel	Use VTVM. DC probe thru 100K to point (A). Common to chassis.	Al and Mixer Plate Coil	Use only enough generator output to provide a usable indication. Adjust for maximum deflection.
2.	"	"	"	43.5MC	"	"	A2	"
3.	"	"	"	45.5MC	"	"	A3	"
4.	"	"	44MC (10MC Swp.)	43.25MC 45.75MC	"	Vert. Amp. thru 100K to point (A). Low side to chassis.		Use only enough sweep generator output to provide a usable pattern on scope. Check for response similar to Fig. 1. If necessary, retouch Mixer Plate Coil and Al thru A3 for desired response.

4.5MC TRAP ALIGNMENT

Set Contrast fully clockwise.
Remove the 2nd Video IF Tube from its socket.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
5.	.01mfd	High side to point (A). Low side to chassis.	4.5MC (Unmod.)	Any non-interfering channel	DC probe thru diode probe (Fig. 2) to pin 11 (cathode) of picture tube. Common to chassis.	A4	Use maximum generator output. Adjust A4 for MINIMUM deflection. Replace 2nd Video IF tube in its socket.

SOUND IF ALIGNMENT

Tune in a TV Station and adjust controls for normal operation. Connect an output meter across the speaker voice coil. Adjust A5, A6 and the Sound Clarifier for maximum deflection, then maximum undistorted sound.

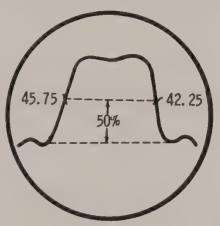


FIG.1

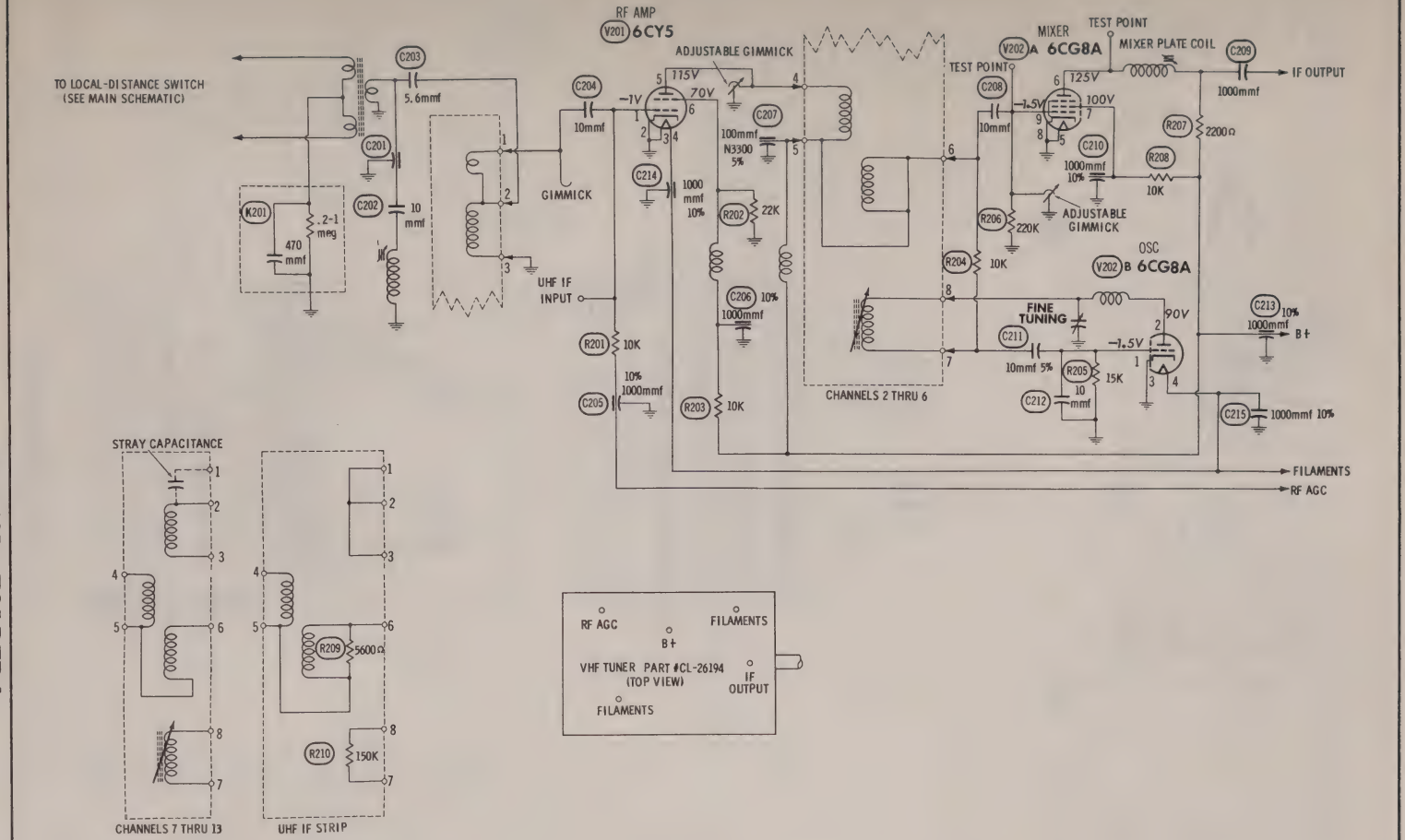
FIG.2

AM TUNER ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	High side thru .01mfd to pin 7 (grid) of Converter. Low side to chassis.	455KC (400∿ Mod.)	Tuning gang fully open	Across voice coil	A7, A8, A9, A10	Adjust for maximum output.
2.	Loop	1500KC	1500KC	"	All	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.	"	"	Tune to maximum signal	"	A12	Adjust for maximum output. Repeat steps 2 and 3.



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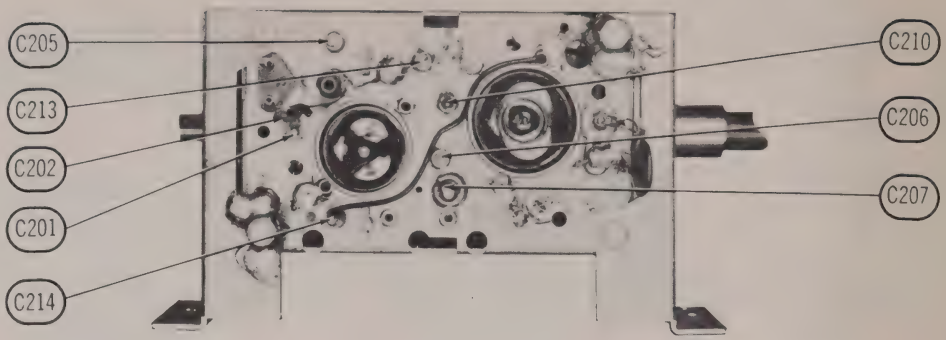
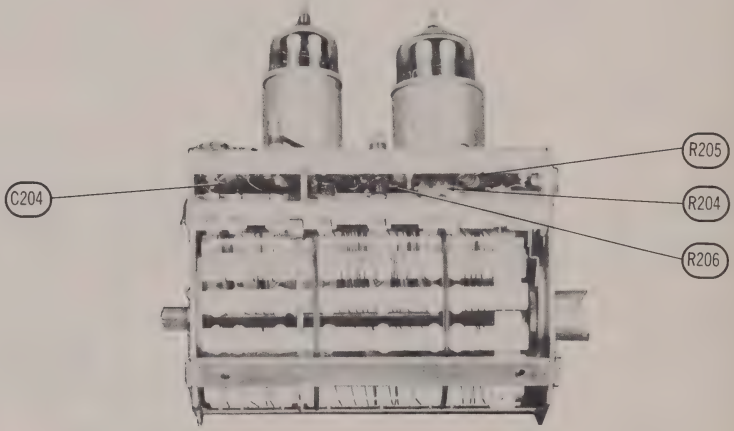
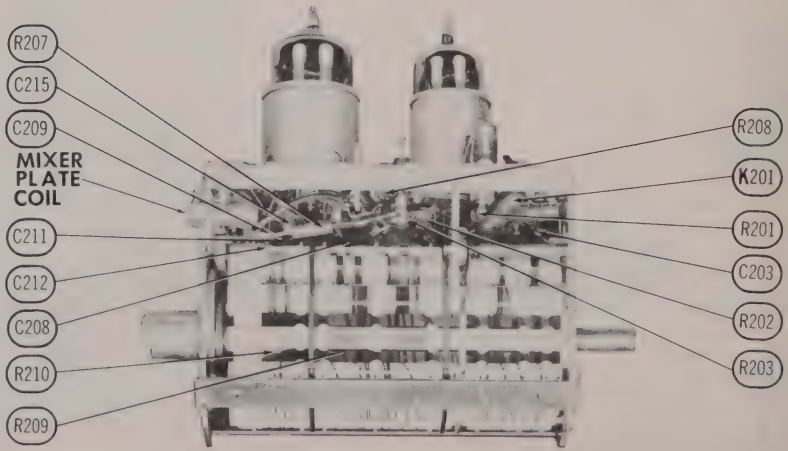
VHF TUNER CL26194, -1

OLYMPIC MODELS CA205, U, KA215, U, KA217, U, TAY199, U, TA200, U (Ch. JA, JAU, 129)

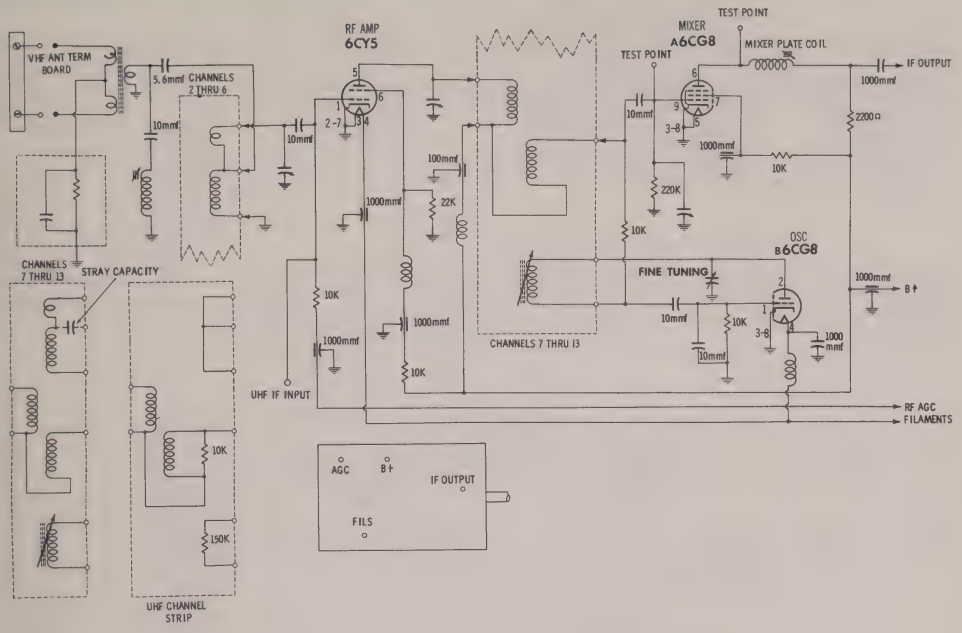
FOLDER 1







TUNER CL26194



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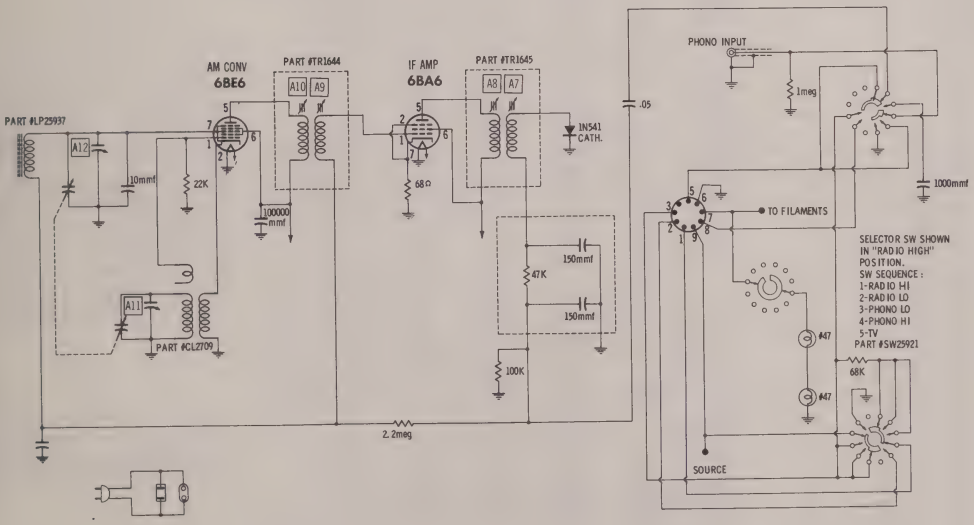
VHF TUNER With UHF Provisions - CL26405-4



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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AM TUNER CH. 129

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	CBS • GENERAL ELECTRIC • USE	TYPE	ITEM No.	RAYTHEON • SYLVANIA • USE	TYPE
V1	1st Video IF Amp.	6DK6	V7	Vert. Mult. - Vert Output	6CM7
V2	2nd Video IF Amp.	6DK6	V8	Horiz. Mult.	6CG7
V3	Video Output - Sound IF Amp.	6AW8A	V9	Horiz. Output	6DQ6A (6CU6) * 6AX4GT
V4	Audio Detector	6DT6	V10	Damper	
V5	Audio Output	6CU5	V11	HV Rect.	1G3GT (1B3GT) *
V6	Sync Sep.	6AV6	V12	LV Rect.	5U4GB

* Alternate

PICTURE TUBE

ITEM No.	REPLACEMENT DATA: OLYMPIC PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	NOTES
V13	21CBP4A	21CBP4A ①	21CBP4-A ①	21CBP4/21CBP4A ①	21CBP4/21CBP4A ②	① Aluminized ② ③ Silver Screen "85"

ELECTROLYTIC CAPACITORS

ITEM No.	RATING: CAP	RATING: VOLT	REPLACEMENT DATA: OLYMPIC PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	60	350	CO-25794	PR4-450	BRT03235 BRT03235	WT458		TVA-3636 *	
B	60	350							
C	60	200							
C2	50	250	CO-2068-3	PR8585	BR3025	TC39	TD-50-450	TVA-1713	
C3	10	450	CO-4022-2	PR8730	BR1045	TC72	TD-10-450	TVA-1706	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA: AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C4	82 N1500 10%	#CC0830K				*		
C5	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C6	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C7	1000 10%		DI-1000	DD-102	PM8DX	CCD-102	GP210	10TS-D10
C8	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C9	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C10	1000 10%		DI-1000	DD-102	PM8DX	CCD-102	GP210	10TS-D10
C11	1000 10%		DI-1000	DD-102	PM8DX	CCD-102	GP210	10TS-D10
C12	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C13	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C14	18 NPO		TCZ-18	C10Q18C	CCTO-180	CNO-418		10TCC-Q18
C15	4.7 10%		NPO-SI 4.7	TCZ-4R7	C10V47C	CCTO-4R7	CNO-547	10TCC-V47
C16	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C17	.22 400V		P488N-22		CUB4P22	4DP-5-224	GEM-4022	4TM-P22
C18	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C19	330		BPD-00033	DD-331	LI0T33	CCD-331	GP330	10TS-T33
C20	220		DI-220	DD-221	LI0T22	CCD-221	GP222	10TS-T22
C21	5000		BPD-005	DD-502	BYA10D5	CCD-502	GP250	5HK-D50
C22	5000		BPD-005	DD-502	BYA10D5	CCD-502	GP250	5HK-D50
C23	.1 200V		P388N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P1
C24	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1
C25	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C26	.023 400V		P488M-023	DD-303	CUB4S23	4DP-3-233	GEM-4123	4TM-S23
C27	6.8 N750 10%		N750-DI 6.8	DT2-6R8	C10V68C	CCTO-6R8	CNO-568	10TCC-V68
C28	330 10%		DI-330	DD-331	LI0T33	CCD-331	GP330	10TS-T33
C29	1000 10%		DI-1000	DD-102	PM8DX	CCD-102	GP210	10TS-D10
C30	5000		BPD-005	DD-502	BYA10D5	CCD-502	GP250	5HK-D50
C31	5000		BPD-005	DD-502	BYA10D5	CCD-502	GP250	5HK-D50
C32	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP310	5HK-S10
C33	5 N750		P28N-5	DT5-5	C10V5U	CCTN-050	CNT-550	10TCU-V50
C34	.56 500V		P288N-05	DA2-503	CUB3S	3DP-3-503	GEM-435	3TM-S5
C35	5000		BPD-005	DD-502	BYA10D5	CCD-502	GP250	5HK-D50
C36	5000		BPD-005	DD-502	BYA10D5	CCD-502	GP250	5HK-D50
C37	.0047 600V		P688N-0047	DD-472	CUB6S47	6DP-1-472	GEM-6247	6TM-D47
C38	2000		BPD-002	DD-202	BYA10D2	CCD-202	GP230	5HK-D20
C39	470		BPD-00047	DD-472	BYA10T47	CCD-471	GP347	10TS-T47
C40	.18 400V		P488N-18		CUB4P1	4DP-4-184	GEM-4015	4TM-P15
C41	.0047 600V 10%		V84C6D47-10%		PM6D47	6DP-1-472	JL-247	6TM-D47
C42	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C43	.035 500V	#CO-O-8353K			CUB03S5			5TM-S35
C44	.1 400V		P488N-1	DF-104	CUB4D1	4DP-3-104	GEM-401	4TM-P1
C45	.0047 600V 10%		V84C6D47-10%		PM6D47	6DP-1-472	JL-247	6TM-D47
C46	.01 1600V		P1084CM-01	DD18-103	CUB16S1	16DP-3-103	GEM-1611	MB-S1
C47	.22 200V		P288N-22		CUB2P22	2DP-4-224	GEM-2022	2TM-P22
C48	470 10%		DI-470	DD-471	BSB7Y47	CCD-471	GP347	10TS-T47
C49	.1 200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P1
C50	3900 10%		1464-0029		1R3D39	CM-3DB-392K	MC2452.5	MS-Z39
C51	.1 600V		P688N-1	DF-104	CUB6P1	6DP-4-104	GEM-601	6TM-P1
C52	230 10%	Note 1	DI-230	DD-231	LI0T22	CCD-221	GP322	10TS-T22
C53	.001 600V 10%		V84C6D1-10%	DD-102	PM6DX	6DP-1-102	GP210	6TM-D1
C54	110-580	#CT2526				467		
C55	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C56	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1
C57	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C58	100 3000V 10%	#CO37EL					3DY-310	
C59	68 3000V 10%	#CP4520					3DY-468	
C60	.01 600V		P688N-01	DS-103	CUB6S1	6DP-2-103	GEM-651	6TM-S1

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.
# Olympic Part Number. Note 1. May not be used in some versions.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: OLYMPIC PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS - IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1500Ω	½	PT2540S	F1-7	RTV-670			Picture (Contrast) Volume Power Off-On Brightness
B	1meg	½		R3-52		†Ⓠ-963	■UE3653-B	
C	Switch	½	PT5702	KK-1				
R2A	1meg	½		B-69	A47-1meg-S	Q11-137	U56	
B	Shaft	½	PT2643S	Not Req.	KS8-3	Not Req.	Not Req.	Vert. Hold
R3A	2meg	½		B-75	A47-2meg-S	Q11-139	U56	
B	Shaft	½	PT2643G	Not Req.	KS8-3	Not Req.	Not Req.	
R4A	1meg	½		B-69	A47-1meg-S	Q11-137	U54	Horiz. Hold
B	Shaft	½		Not Req.	KS8-3	Not Req.	Not Req.	
R5A	500K	½	PT2579G	B-59	B47-500K-S	B11-153	PTA55L	Vert. Linearity
B	Shaft	½		Not Req.	Not Req.	TM4	Not Req.	
R6A	2.5meg	½	PT5008-1	AB-53	B47-2.5meg-S	B11-239	TA255L	Height
B	Shaft	½		AK-1	Not Req.	TM4	Not Req.	

† "Concentrikit" equivalent: K-6 Kit with Base Elements and Shafts: B17-109, P13-116 (Panel) (Not available as a factory assembled unit.) B13-137, R1-202 (Rear) KR-1 (Switch)

■ "STA-LOC" equivalent: FA152R, RU16A, CS1500, 152125, U54l.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R7	470Ω	
R8	470Ω	
R9	180Ω	
R10	180Ω	
R11	1meg	
R12	1000Ω	
R13	22K	
R14	330Ω	
R15	47Ω	
R16	330Ω	
R17	180Ω	
R18	5600Ω	
R19	1.5meg	
R20	1meg	
R21	1500Ω	
R22	33Ω	
R23	10K	
R24	4700Ω 4W	
R25	150K	
R26	220K	
R27	22K	
R28	2700Ω	
R29	100K	
R30	22K	

ITEM No.	RATING	REMARKS
R31	47K	
R32	270K	
R33	150K	
R34	560K	
R35	10K	
R36	1000Ω	
R37	1meg	
R38	390Ω 2W	
R39	1meg	
R40	22K	
R41	2.2meg	
R42	470K	
R43	100K	
R44	1.5meg	
R45	27K	
R46	150K	
R47	10meg	
R48	1.5meg	
R49	1.5meg	
R50	12K	
R51	150Ω	
R52	1meg	
R53	470K	
R54	1000Ω 2W	

ITEM No.	RATING	REMARKS
R55	100Ω	
R56	560Ω	
R57	560Ω	
R58	330K 1W	
R59	330K 1W	
R60	68000 1W	
R61	3300Ω 2W	
R62	820Ω	
R63	470K	
R64	150K	
R65	47Ω	
R66	22K	
R67	5800Ω 2W	Note 1
R68	3300Ω 2W	Note 1
R69	150K	
R70	100K	
R71	15Ω	
R72	3.3Ω 1W	
R73	4700Ω	
R74	47K	
R75	470K	
R76	22K	

Note 1. In some versions R67 and R68 may be a single 4 Watt 8900Ω Resistor.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA: OLYMPIC PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	RF Choke	CL-1535	19-3036	19-3036	TV-180	6176	VP-1	36uh
L2	1st Video IF	CL-4753	17-4534	17-4534	TV-131		VF-4	
L3	2nd Video IF	CL-4531	17-4522	17-4522	TV-130	6219	VF-3	
L4	3rd Video IF	CL-4791	17-4523	17-4523	TV-130	6219	VF-3	
L5	Resonant Choke	CK-4225						1.7uh, Note 1
L6	RF Choke		19-1009	19-1009		4611		8uh
L7	Series Peaking Coil	CL-26425	19-3100	19-3100	TV-194	6112	VP-4	110uh
L8	Shunt Peaking Coil	CL-26426	19-4160	19-4160	TV-196	6120		160uh
L9A	Sound Takeoff	TR-3386-1						
B	4.5MC Trap							
L10	Series Peaking Coil	CL-25787	19-3125	19-3125				135uh
L11	Shunt Peaking Coil	CL-25786	19-3250	19-3250	TV-185	6181	VP-6	340uh
L12	2nd Sound IF	CL-4021	17-3412	17-3412				
L13	Resonant Choke	CK-4416						6. 8uh
L14	Quadrature Coil	CL-3603-1					SD-5	
L15	Resonant Choke	CK-4417						5. 8uh

Note 1. May not be used in some versions.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: OLYMPIC PART No.	Halldorson PART No.	Merit PART No.	Miller PART No.	Ram PART No.	Thordarson PART No.	NOTES
L16	50Ω		CL5464-1						Horiz. Stabilizer

FILTER CHOKE

ITEM No.	RATINGS: CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000 ^/s)	REPLACEMENT DATA: OLYMPIC PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L17	.200A	63Ω	.7 Hy.	CK4047				C-2327 ①		C-36X

① Drill new mounting hole.

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	SEC. 1.	SEC. 2	REPLACEMENT DATA: OLYMPIC PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V ② 1.35A	580VCT ② .200A	5V ② 3A	TR-4007-2	26R40	P-3867	P-700	P-8264	26R40	R-85BC
	SEC. 3	SEC. 4	SEC. 5							
	6.3V ② 7.8A									

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: OLYMPIC PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Rogers PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T2	Vert. Output	TR-2579I-1A							A-141X
T3	Alt. Vert. Output	TR-2579I-2							
	Yoke-Horiz. (183MS) (90°)-Vert. (39MH)	CL-3600-4	Y-16 ①	MDF-92 ① ②	Y90F19/43 ① ②	PCM2045 ① ②	DY-16A ① ②	Y-16 ①	Y-41 & NW-3 ① YC-1 & CL-1
	Rear Cover and Centering Device	PP-5640							
	Yoke Clamp	SP-5672							
T4	Horiz. Output	TR-3599-5	FLY-143 *	HVO-131③ * ‡	X51 *	FFR166 ③ * ‡	HO-296 *	FLY-143*	D-120 *

① Connect same as original. ③ Drill new mounting hole(s).
② Use original Horiz. Yoke Damping Network if necessary.
‡ This part may be superceded by Parts Manufacturer's introduction of special unit for this application.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	Ram Replacement Connections	Rogers Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
9	4	8	9	5	4	4	9
8	8	6	8	4	8	8	8
6	7	8	6	4	7	7	6
3	2	5	4	3	2	2	3
2	5	4	3 & 2	2	5	5	2
1	1	3	1	1	1	1	1
Special Notes →	④	④		④	③		

④ Filament requires two turns.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	SEC.	REPLACEMENT DATA: OLYMPIC PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T5	2000Ω	3-4Ω	TR2765-1-B①	26S53	A-3025	AU-606	A-3332	26S53	S-13X	① Alternate Part #TR2537

SPEAKER

ITEM No.	TYPE: SIZE	FIELD	V. C. IMP.	REPLACEMENT DATA: OLYMPIC PART No.	QUAM PART No.	NOTES
SP1	4"	PM	3-4Ω	SK4342	4A07R	
	5"	PM		SK7788-2		Model KA215
	6"	PM	3-4Ω	SK30564	6A1	Model CA305

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	OLYMPIC PART No.	REPLACEMENT DATA
K1	Vert. Integrator	820mmf, 2000mmf, 68K, 68K, 100K	PC26048	
K2	Horiz. AFC & Mult. Grid	1000mmf, 150mmf, 1000mmf, 1000mmf, 4700mmf, 68K, 82K, 100K, 560K, 620K, 1meg, 1meg	PC25716	
K3	Horiz. Mult. Plate	680mmf, 1000mmf, 820Ω, 82K, 470K	PC25714	

OLYMPIC MODELS CA205, U, KA215, U, KA217, U, TA199, U, TA200, U (CH. JA, JAU, 129)

FOLDER 1

PARTS LIST AND DESCRIPTIONS (Continued)

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA					
	CURRENT (Measured)	OLYMPIC PART No.	INTERNATIONAL PART No.	ITT PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M1	Signal	RF-5465 *	1T1 †	KI615 *			* Selenium (Dual Diode) † Selenium (Single Diode 2 required)

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			OLYMPIC PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	C	½A 250V	FU26203	FH4344	332.500 (C½A 250V)	346002	C ½	HC 3/10 to 1/2
M3	3½" length of	#26 wire						
M4	3½" length of	#26 wire						

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		OLYMPIC PART No.	CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M5	1N295 *		1N60	1N295	1N295	Video Det. * 1N60 or 1N64 Alternates

MISCELLANEOUS

ITEM No.	PART NAME	OLYMPIC PART No.	NOTES
M6	Tuner	CL26194	VHF, Standard Coil replacement Part #GG-4220A
	Tuner	CL26405-4	VHF, with UHF Provisions
		CL26405-5	UHF
M7	Switch	SW-2966-1	Local-Distant (DPDT) Slide Type

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Safety Glass	PP3656	
Mask	PP3646-1	
Knob	KN26264	Channel Selector, VHF Models
Knob	KN26268	Channel Selector, VHF-UHF Models
Knob	KN26266	Fine Tuning, VHF Models
Knob	KN26269	Calibrated Dial for UHF
Knob	KN26491	Radio Tuning, All Combination Models
Knob	KN25775	Volume
Knob	KN25773	Brightness, Contrast
Knob	KN26270	Vertical Hold, Horizontal Hold
Knob	KN26318	Loudness (Rear), Models TAY199, U
Knob	KN26487	Balance Loudness (Front), Models TAY199, U
Knob	KN26485	Channel A, Bass (Front), Models TAY199, U
Knob	KN26490	Channel B, Bass (Rear), Models TAY199, U
Knob	KN26486	Channel A, Off, Treble (Front), Models TAY199, U
Knob	KN26489	Channel B, Treble (Rear), Models TAY199, U
Knob	KN26493	Function Selector, Models TAY199, U
Knob	KN26488	Function Selector, Model KA215
Cabinet	CA26449	Model CA205
Cabinet	CA26458	Model TA200
Cabinet	CA26467	Model KA215

WIRING DATA

High Voltage Lead	Use BELDEN No. 8869
Shielded Hook-up Wire	Use BELDEN No. 8885 (Single Conductor) 8738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No. 8874
300Ω Tuner Input Lead	Use BELDEN No. 8225
300Ω Antenna Lead-in	Use BELDEN No. 8230 or 8275
Antenna Rotor Cable	Use BELDEN No. 8464 (Flat) or 8484 (Round) - 4 Conductor 8485 (Round) - 5 Conductor 8488 (Round) - 8 Conductor

TUNER
CL26194, -1

Note: CL26194-1 same as CL26194 but does not include trap.

PARTS LIST AND DESCRIPTIONS

TUBES

• CBS •		GENERAL ELECTRIC •		RAYTHEON •		SYLVANIA •	
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V201	RF Amp.	6CY5	V202	Mixer-Osc.	6CG8A

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C201								
C202	10		NPO-DI 10	DTZ-10	C10Q10C	CCTO-100	CNO-410	10TCC-Q10
C203	5.6							10TCC-V56
C204	10		NPO-DI 10	DTZ-10	C10Q10C	CCTO-100	CNO-410	10TCC-Q10
C205	1000 10%		EF-001	MFT-1000		CCF-102	CT280A	
C206	1000 10%		EF-001	MFT-1000		CCF-102 *	CT280A	
C207	100 N3300 5%							
C208	10		NPO-DI 10	DTZ-10	C10Q10C	CCTO-100	CNO-410	10TCC-Q10
C209	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C210	1000 10%		EF-001	MFT-1000		CCF-102	CT280A	
C211	10 5%		NPO-DI 10	DTZ-10	C10Q10C	CCTO-100	CNO-410	10TCC-Q10
C212	10		NPO-DI 10	DTZ-10	C10Q10C	CCTO-10	CNO-410	10TCC-Q10
C213	1000 10%		EF-001	MFT-1000		CCF-102	CT280A	
C214	1000 10%		EF-001	MFT-1000		CCF-102	CT280A	
C215	1000 10%		EF-001	MFT-1000		CCF-102	CT280A	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R201	10K	
R202	22K	
R203	10K	
R204	10K	

ITEM No.	RATING	REMARKS
R205	15K	
R206	220K	
R207	2200Ω	
R208	10K	

ITEM No.	RATING	REMARKS
R209	5600Ω	
R210	150K	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	OLYMPIC PART No.	REPLACEMENT DATA	
K201	Antenna Filter	470mmf, .2-1meg		Centralab Sprague	RC-471 ACl-1

ALIGNMENT INSTRUCTIONS

VHF OSCILLATOR ALIGNMENT

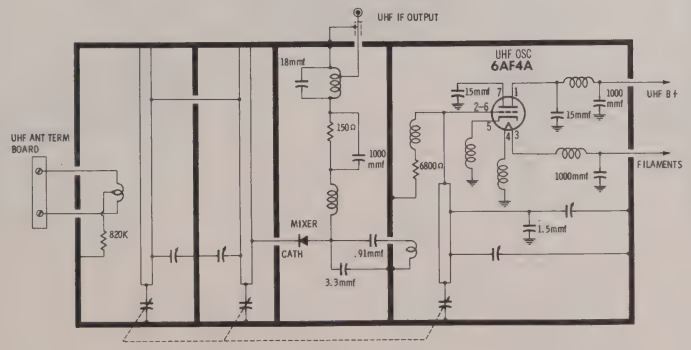
The individual channel adjustment screws are accessible one at a time, thru a hole in the front of the tuner, as the Channel Selector is rotated. Set the Fine Tuning to the center of its range and switch to channel to be adjusted. Adjust for best picture and sound.

VHF RF AND MIXER ALIGNMENT

This portion of the tuner has been properly aligned at the factory and is very stable. Alignment of this portion should not be attempted in the field.

UHF TUNER ALIGNMENT

This portion of the tuner has been properly aligned at the factory and is very stable. Alignment of this portion should not be attempted in the field.



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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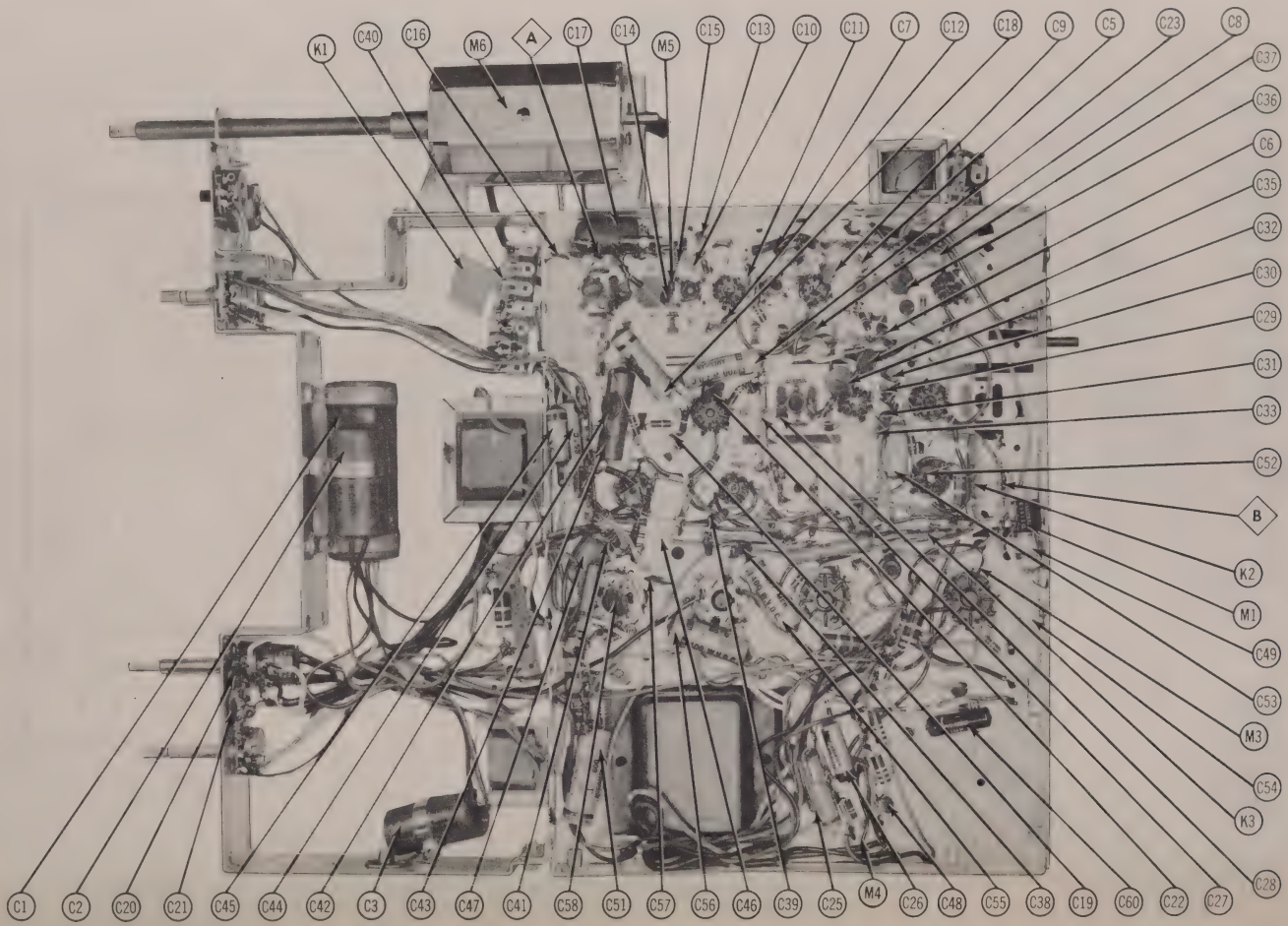
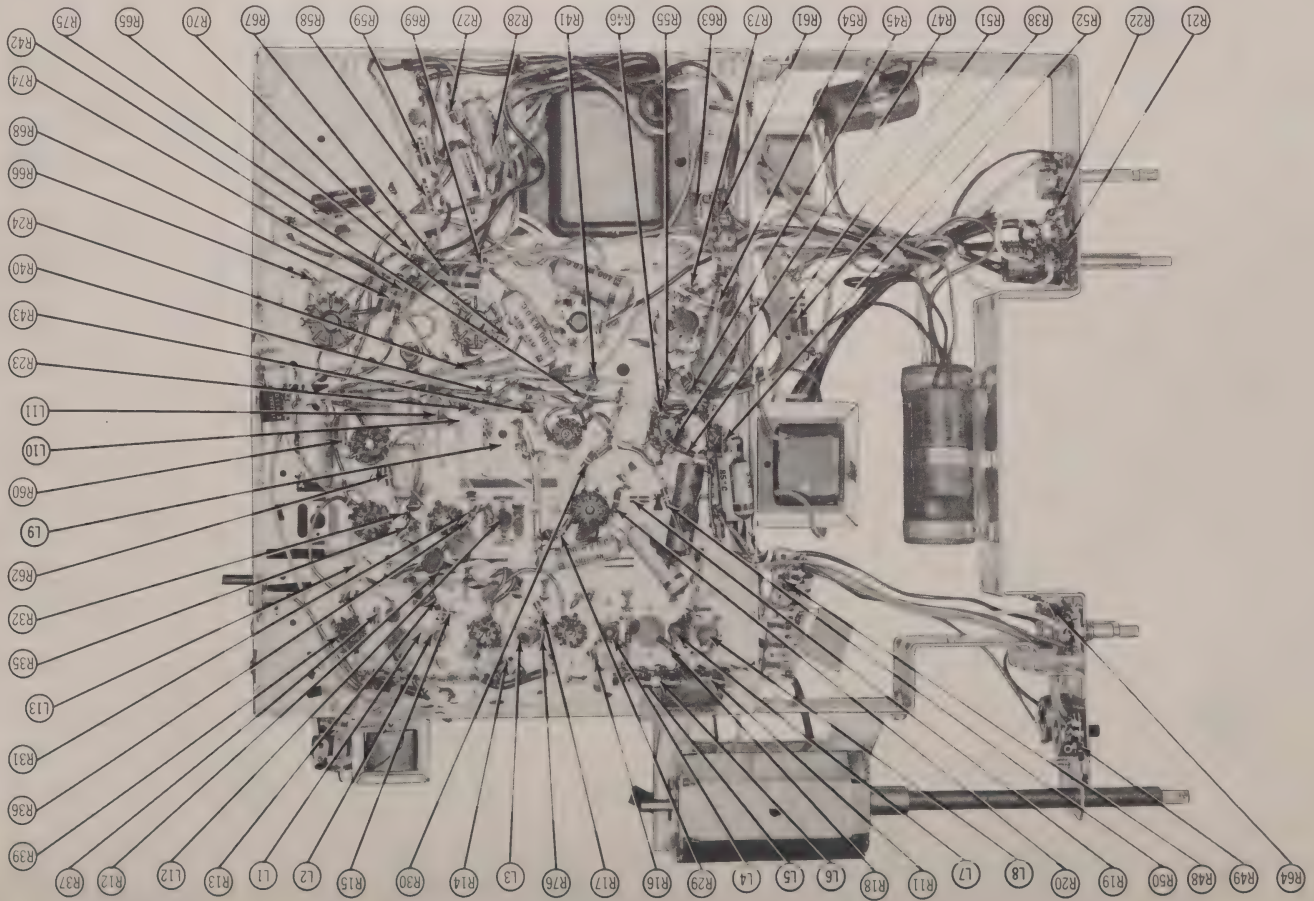
UHF TUNER CL-26405-5



CHASSIS BOTTOM VIEW - CAPACITOR & MISC. IDENT.

CHASSIS BOTTOM VIEW - RESISTOR & INDUCTOR IDENT.

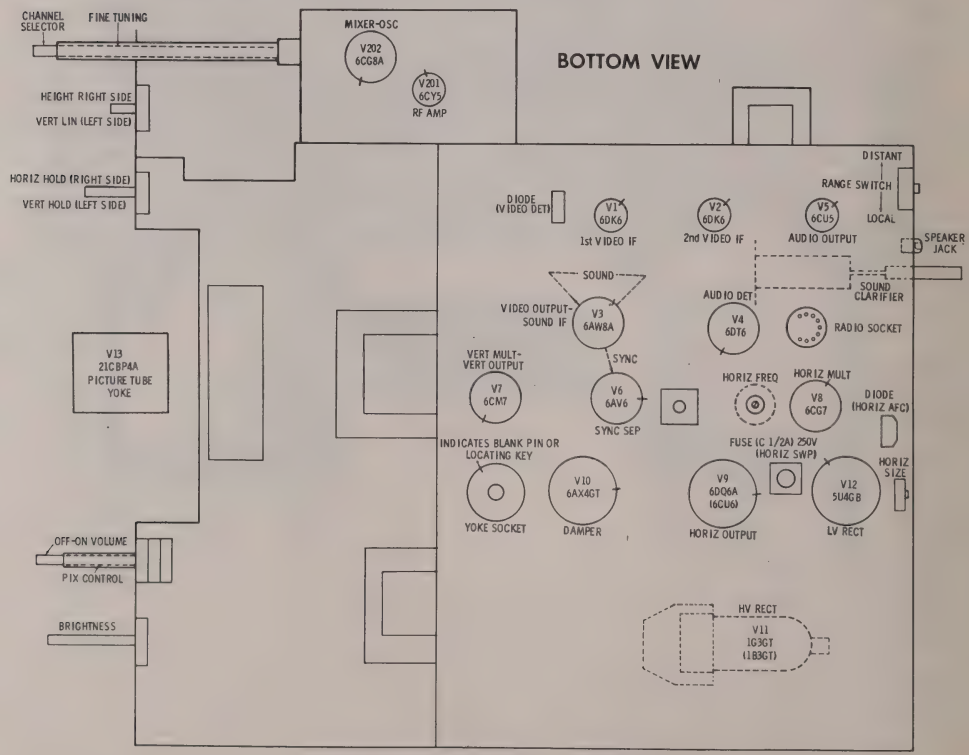


RESISTANCE MEASUREMENTS

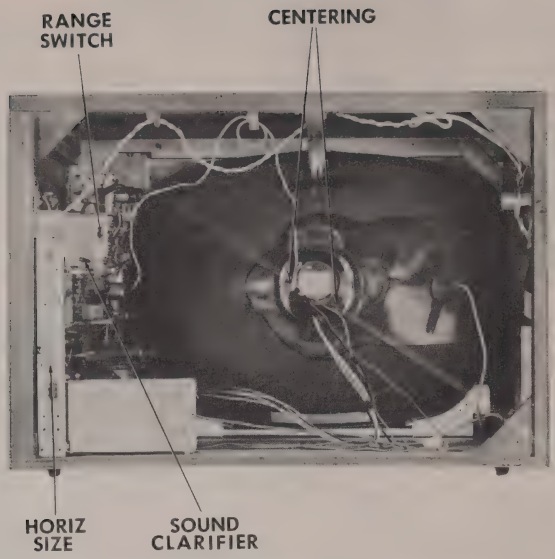
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6DK6	100K	47Ω	.1Ω	0Ω	▪330Ω	▪330Ω	0Ω		
V2	6DK6	.2Ω	180Ω	.1Ω	0Ω	▪330Ω	▪330Ω	0Ω		
V3	6AW8A	0Ω	100K	▪22K	.1Ω	0Ω	● 750Ω	650K	▪0Ω	†4700Ω
V4	6DT6	3Ω	1000Ω	.1Ω	0Ω	†270K	▪10K	560K		
V5	6CU5	¶	500K	.1Ω	0Ω	500K	†390Ω	†540Ω		
V6	6AV6	2.7meg	0Ω	.1Ω	0Ω	NC	NC	†100K		
V7	6CM7	†2700Ω	NC	0Ω	0Ω	.1Ω	†▪1.8meg	● 1.2meg	● 1.8meg	100Ω
V8	6CG7	†10K	2.2meg	820Ω	.1Ω	0Ω	† 82K	65K	820Ω	0Ω
V9	6DQ6A	0Ω	0Ω	NC	†8900Ω	470K	TP	.1Ω	0Ω	TOP CAP †40Ω
V10	6AX4GT	NC	TP	¶200K	NC	†0Ω	NC	0Ω	.1Ω	
V11	1G3GT	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP †600Ω
V12	5U4GB	NC	¶	NC	30Ω	TP	28Ω	TP	¶	
V13	21CBP4A	0Ω	22K	Pin 6 22K	Pin 10 †60K	Pin 11 ● 250K	Pin 12 .1Ω			
V201	6CY5	1meg	0Ω	0Ω	.1Ω	▪0Ω	▪8500Ω	0Ω		
V202	6CG8A	15K	▪10K	0Ω	.1Ω	0Ω	▪2200Ω	▪10K	0Ω	220K
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
● THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
▪ MEASURED FROM 130V SOURCE.
† MEASURED FROM 270V SOURCE.
‡ MEASURED FROM PIN 3 OF V10.

NC NO CONNECTION
TP TIE POINT



TUBE PLACEMENT CHART



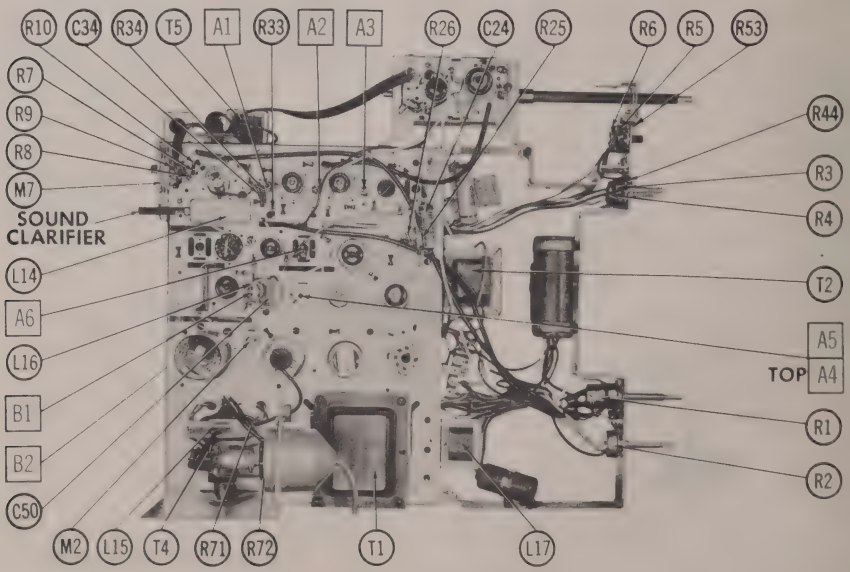
CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Suggested Alignment Tools:
GENERAL CEMENT #8271, 8273, 8275, 8276, 8721, 8722, 9150, 9298,
WALSCO #2516, 2519 5003

Turn the set on and tune in a TV station, preferably with a test pattern. Connect a clip lead from point Ⓑ to chassis. Connect another clip lead across the Horizontal Stabilizing coil (L16). Adjust the Horizontal Hold until the picture synchronizes horizontally. (It may float back and forth.) Remove the clip lead from L16. Adjust the Horizontal Stabilizing Coil slug (B1) until the picture is again in frequency. Remove the clip lead from point Ⓑ and chassis.

Turn the Horizontal Size trimmer (B2) counterclockwise until a vertical white line (Drive line) appears near the center of the screen, then turn clockwise until the line just disappears. If drive line cannot be obtained, adjust B2 for proper width. If B2 is adjusted, recheck adjustment of B1 and Horizontal Hold.



CHASSIS—TOP VIEW

PHOTOFACT® Folder with CIRCUITRACE®

WESTINGHOUSE MODELS H-P3200, U, H-P3300, U, H-P3301, U (Ch. V-2384-1, V-2384-2)

WESTINGHOUSE MODELS H-P3200, U, H-P3300, U, H-P3301, U (Ch. V-2384-1, V-2384-2)

MODEL H-P3300U (Ch. V-23842)

WESTINGHOUSE MODELS H-P3200, U, H-P3300, U, H-P3301, U (Ch. V-2384-1, V-2384-2)

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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WESTINGHOUSE MODELS H-P3200, U, H-P3300, U, H-P3301, U (Ch. V-2384-1, V-2384-2)

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 2 metal screws holding rear cover. Remove antenna leads. Remove rear cover.
2. Remove 9 push-on type knobs from front and side of cabinet. Note: Fine Tuning Knob not removable from outside on early models.
3. Remove 2 metal screws and 4 bolts holding the Handle-Antenna-Speaker Assembly to cabinet. Remove speaker leads. Remove assembly.
4. Remove 3 metal screws from inside cabinet holding chassis to front mask (located in upper left and right corners and on left side).
5. Remove 6 chassis bolts from bottom of cabinet.
6. Remove 1 metal screw holding bracket at upper left rear of cabinet. Rotate bracket out of the way.
7. Spring cabinet out at upper left corner and slide chassis out the rear of the cabinet.

PICTURE TUBE REMOVAL

1. Remove chassis.
2. Remove picture tube socket, hi voltage lead, and yoke.
3. Remove 8 metal screws, 2 at each corner of the picture tube, holding picture tube mounting brackets to chassis
4. Remove picture tube.

MODEL H-P3300U (Ch. V-2384-2)

CAUTION

ONE SIDE OF AC LINE CONNECTED TO CHASSIS.

TRADE NAME	Westinghouse	Models	Chassis
		H-P3200, H-P3300, H-P3301	V-2384-1
		H-P3200U, H-P3300U, H-P3301U	V-2384-2
MANUFACTURER	Westinghouse Electric Corp., Television & Radio Div., Metuchen, N. J.		
TYPE SET	Television Receiver		
TUBES	VHF - Fifteen. UHF - Sixteen		
POWER SUPPLY	105-120 Volts AC, 60 Cycle	RATING	130 Watts, 1.35 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)		

SERVICING IN THE FIELD

SAFETY GLASS REMOVAL

For picture tube, and safety glass cleaning, it is necessary to remove the chassis. (See "Disassembly Instructions".)

FUSE

A 3/4 amp S/B fuse is used for horizontal sweep circuit protection. (For location, see M4, "Chassis Top View".)

FUSE DEVICE

A Circuit Breaker is used for low voltage power supply protection, and may be reset by depressing the reset button. (For location, see "Cabinet-Rear View".)

TUNER OSCILLATOR ADJUSTMENTS

To touch-up the VHF Oscillator, it is necessary to remove the chassis. (See "Disassembly Instructions".)

AGC

A Jumper Shunting R42 is sometimes removed in strong signal areas (See TV Schematic). This is a factory adjustment and normally no changes required in the field.

FOCUS

No provision is made to vary the focus on this receiver.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENTS

Coarse adjustment of the Horizontal Hold is accomplished by the proper setting of the Horizontal Frequency slug (B2).

WIDTH

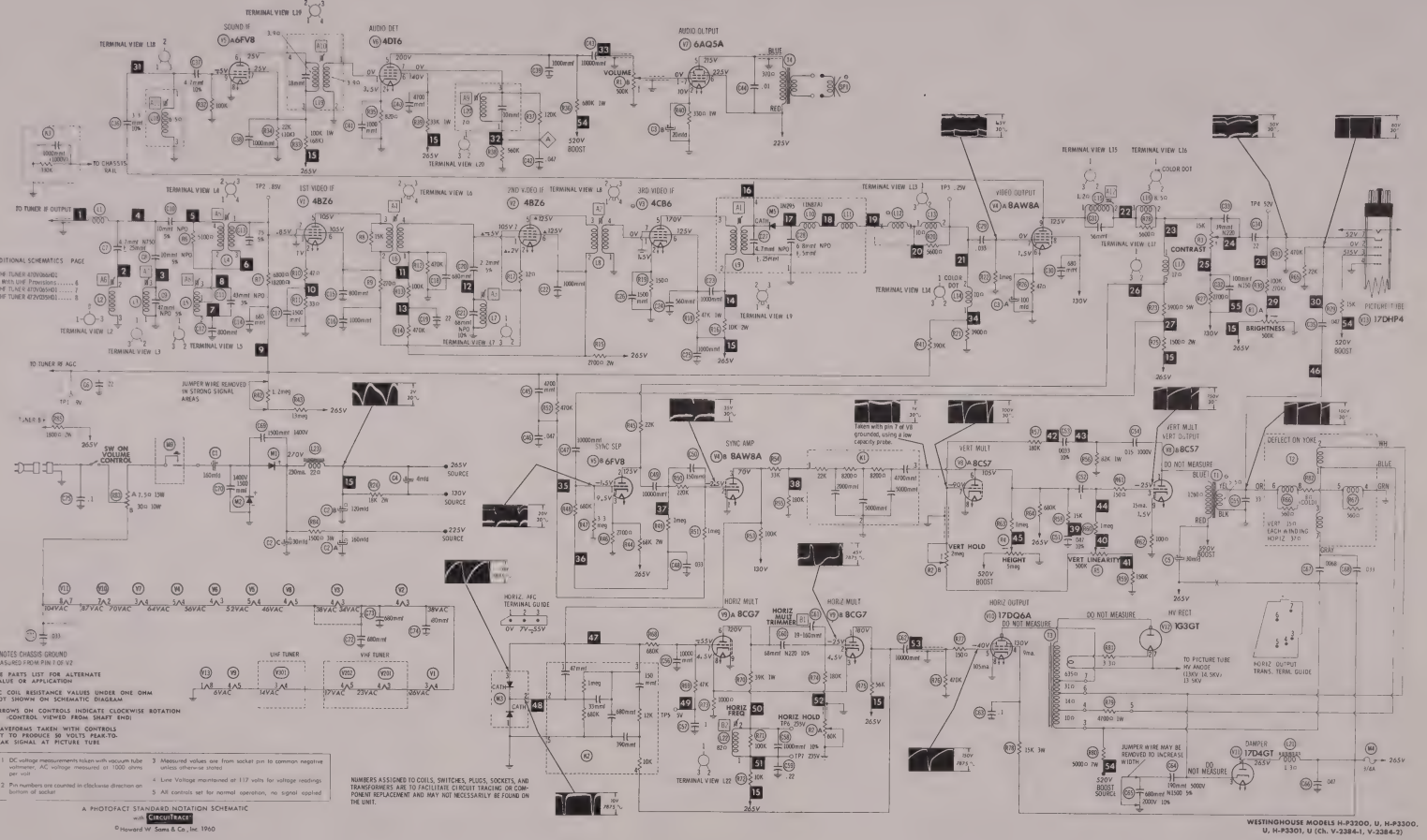
A Jumper Shunting C65 is used to decrease Width (See TV Schematic). This is a factory adjustment and normally no changes required in the field.

CENTERING

Centering is accomplished by 2 magnetic rings, located behind the yoke, on the neck of the picture tube.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1960 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America


TERMINAL VIEW L19
SOUND IF
V5 6FV8
AUDIO DET
V6 4DT6
AUDIO OUTPUT
V7 6AQ5A
VOLUME
BLUE
RED
TERMINAL VIEW L18
TERMINAL VIEW L20
TO CHASSIS RAIL
TO TUNER IF OUTPUT
TERMINAL VIEW L4
TERMINAL VIEW L2
TERMINAL VIEW L3
TP2 .85V
1ST VIDEO IF
V1 4BZ6
TERMINAL VIEW L6
TERMINAL VIEW L5
2ND VIDEO IF
V2 4BZ6
TERMINAL VIEW L8
TERMINAL VIEW L7
3RD VIDEO IF
V3 4CB6
TERMINAL VIEW L9
TERMINAL VIEW L13
TP3 .25V
VIDEO OUTPUT
V4 6AW8A
TERMINAL VIEW L14
TERMINAL VIEW L15
TERMINAL VIEW L16
COLOR DOT
CONTRAST
TERMINAL VIEW L17
TP4 52V
BRIGHTNESS
PICTURE TUBE
V11 17DHP4
ADDITIONAL SCHEMATICS PAGE
VHF TUNER 417V0604G1 With UHF Provisions..... 6
VHF TUNER 417V0604D1..... 7
UHF TUNER 417V0504D1..... 8
TO TUNER RF AGC
TP1 -9V
TUNER B+
JUMPER WIRE REMOVED IN STRONG SIGNAL AREAS
SW ON VOLUME CONTROL
265V SOURCE
130V SOURCE
225V SOURCE
SYNC AMP
V8 8AW8A
SYNC SEP
V8 6FV8
VERT MULT
V9 8CS7
VERT MULT VERT OUTPUT
V9 8CS7
DO NOT MEASURE
DEFLECT ON YOKE
VERT HOLD
HEIGHT
VERT LINEARITY
VERT OUT EACH A WINDING HOPIZ SYC
HORIZ. AFC TERMINAL GUIDE
HORIZ MULT
V10 A 8CG7
HORIZ MULT TRIMMER
HORIZ FREQ
HORIZ HOLD
TP5 25V
TERMINAL VIEW L22
HORIZ OUTPUT
V12 17DQ6A
DO NOT MEASURE
HV RECT
V13 1G3GT
TO PICTURE TUBE HV ANODE (LEAV. 16 SKV.) 13 SKV
HORIZ OUTPUT TRANS. TERM. GUIDE
JUMPER WIRE MAY BE REMOVED TO INCREASE WIDTH
DAMPER
V14 17D4GT
DO NOT MEASURE
520V BOOST SOURCE
UHF TUNER
VHF TUNER
104VAC 87VAC 70VAC 64VAC 56VAC 52VAC 46VAC 38VAC 36VAC 38VAC
147VAC 6VAC 147VAC 17VAC 23VAC 4A3 205VAC
DENOTES CHASSIS GROUND
▲ MEASURED FROM PIN 7 OF V2
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)
WAVEFORMS TAKEN WITH CONTROLS SET TO PRODUCE 50 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE
1 DC voltage measurements taken with vacuum tube voltmeter. AC voltage measured at 1000 ohms per volt
2 Pin numbers are counted in clockwise direction on bottom of socket
3 Measured values are from socket pin to common negative unless otherwise stated
4 Line Voltage maintained at 117 volts for voltage readings
5 All controls set for normal operation, no signal applied
A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE
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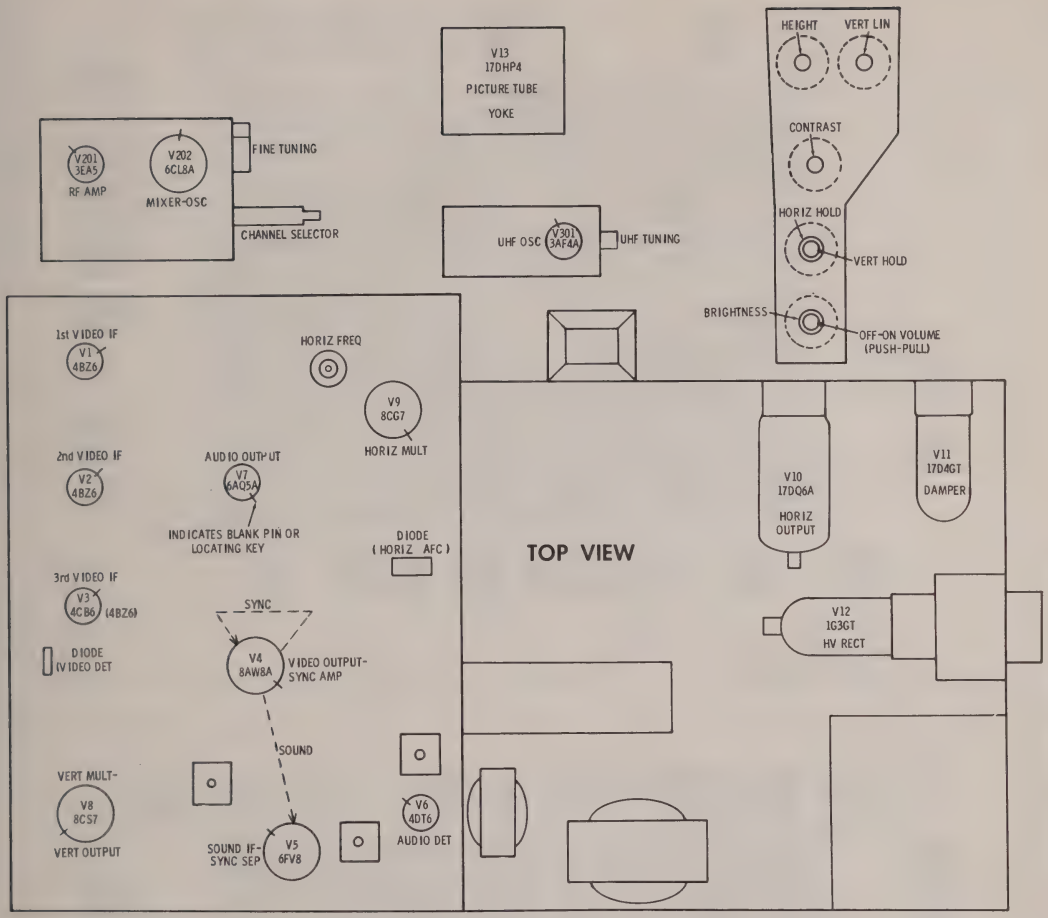
NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.
Taken with pin 7 of V8 grounded, using a low capacity probe.
WESTINGHOUSE MODELS H-P3200, U, H-P3300, U, H-P3301, U (Ch. V-2384-1, V-2384-2)

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce indicated symptoms. Refer to tube placement chart for location and type of tube.

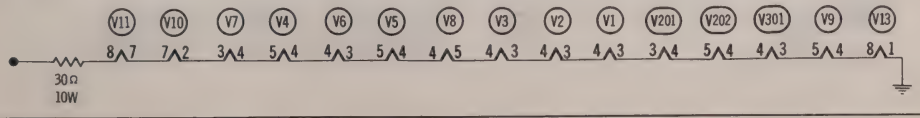
POWER SUPPLY FAILURE
No raster, no sound Circuit Breaker, Rectifiers B+

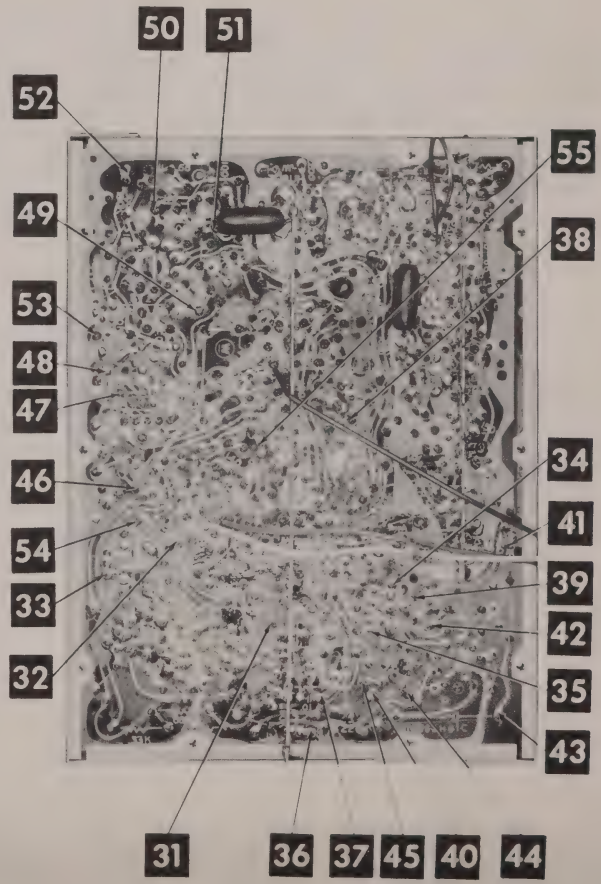
SWEEP FAILURE
No raster, has sound V10, V11, V12, V13 Fuse (Swp)
No vertical deflection V8
Poor vert. linearity or foldover V8
Poor horiz. linearity or foldover V9, V10, V11
Narrow picture V9, V10, V11, Rectifiers (B+)
Vert. off freq. V8
Horiz. off freq. Diode (Horiz. AFC), V9

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster V1, V2, V3, Diode (Video Det.), V4
No pic, no sound, has snow V201, V202, V1
No pic, has sound, has raster V4, V13
Has pic, no sound V5, V6, V7

SYNC FAILURE
No vert. sync V4, V5
No horiz. sync V4, V5, Diode (Horiz. AFC)
No vert. or horiz. sync V4, V5

This receiver employs tubes used in a series filament network, an open filament in any tube will cause the set to be inoperative. (See circuit below.)





A Howard W. Sams CIRCUITRACE® Photo

PRINTED BOARD

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED

ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

The High Voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested Alignment Tools: GENERAL CEMENT #8282, 8606, 8606-L, 9295, 9440
WALSCO #2526, 2543, 2544, 2545

VIDEO IF ALIGNMENT

USE AN ISOLATION TRANSFORMER TO PROTECT THE TEST EQUIPMENT.
Connect the negative lead of a 4 volt bias supply to point TP-1. Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.

	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	High side thru .001mfd to TP-2. Low side to chassis.	Not used	44.25MC (Unmod.)	10	Use VTVM DC probe to TP-3. Common to chassis.	A1	Adjust for maximum deflection.
2.	"	"	45.62MC	"	"	A2	"
3.	"	"	39.75MC	"	"	A3	Adjust for MINIMUM deflection.
4.	"	"	42.75MC	"	"	A4	Adjust for maximum deflection.
5.	"	44MC (10MC Swp.)	39.75MC 41.25MC 42.25MC 43.0MC 45.0MC 45.75MC	"	Vert. Amp. of scope to TP-3. Low side to chassis.		Check for response similar to Fig. 1. If necessary, retouch A1, A2 and A4 for desired response.
6.	High side thru .001mfd to pin 9 (grid) of Mixer. Low side of chassis.	Not used	44.25MC	"	Use VTVM DC probe to TP-3. Common to chassis.	Mixer Plate Coil	Adjust for maximum deflection.
7.	"	"	"	"	"	A5	"
8.	"	"	41.25MC	"	"	A6	Adjust for MINIMUM deflection.
9.	"	"	47.25MC	"	"	A7	"
10.	"	"	"	"	"	A8	"
11.	"	44MC (10MC Swp.)	41.25MC 42.25MC 43.0MC 45.0MC 45.75MC	"	Vert. Amp. of scope to TP-3. Low side to chassis.		Check for response similar to Fig. 2. If necessary, retouch Mixer Plate Coil and A5 for desired response.

SOUND IF ALIGNMENT

Tune in a TV signal, preferably with a test pattern and tone signal. Adjust Fine Tuning for best reception. Set the Volume control so that the sound is audible. Adjust A9 for maximum sound output. Connect a short clip lead from pin 1 (grid) of the 3rd Video IF amplifier to chassis. Connect the DC probe of the VTVM to point (A). Common to chassis. Adjust A10 for maximum negative voltage on the VTVM. Remove the clip lead from the circuit.
Disconnect the antenna lead and place near the antenna terminals so that the signal coupled to the receiver produces a very weak picture. A hiss will be noticed in the sound. Adjust A11 for maximum negative voltage on the VTVM. If the VTVM indicates a broad response while adjusting A11, move the antenna lead farther from the antenna terminals.

4.5MC TRAP ALIGNMENT

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
12.	High side thru .001mfd to TP-3. Low side to chassis.	4.5MC (Unmod.)	Any non-interfering channel.	Demodulator probe thru .001mfd to TP-4. Common to chassis.	A12	Adjust for MINIMUM deflection.

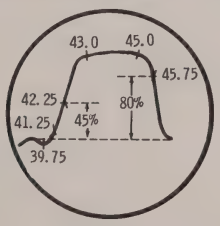


FIG.1

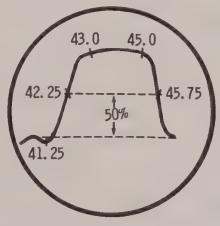
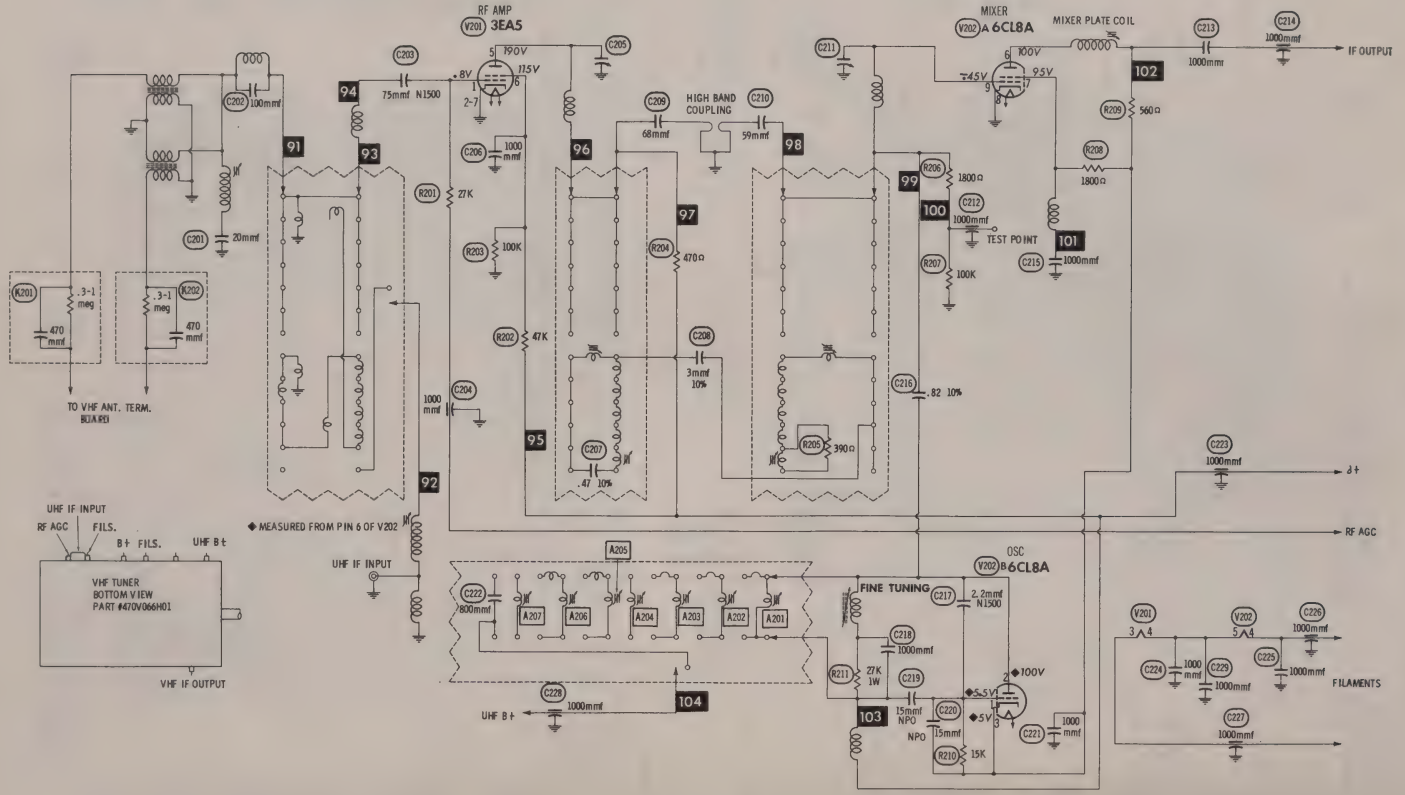


FIG.2



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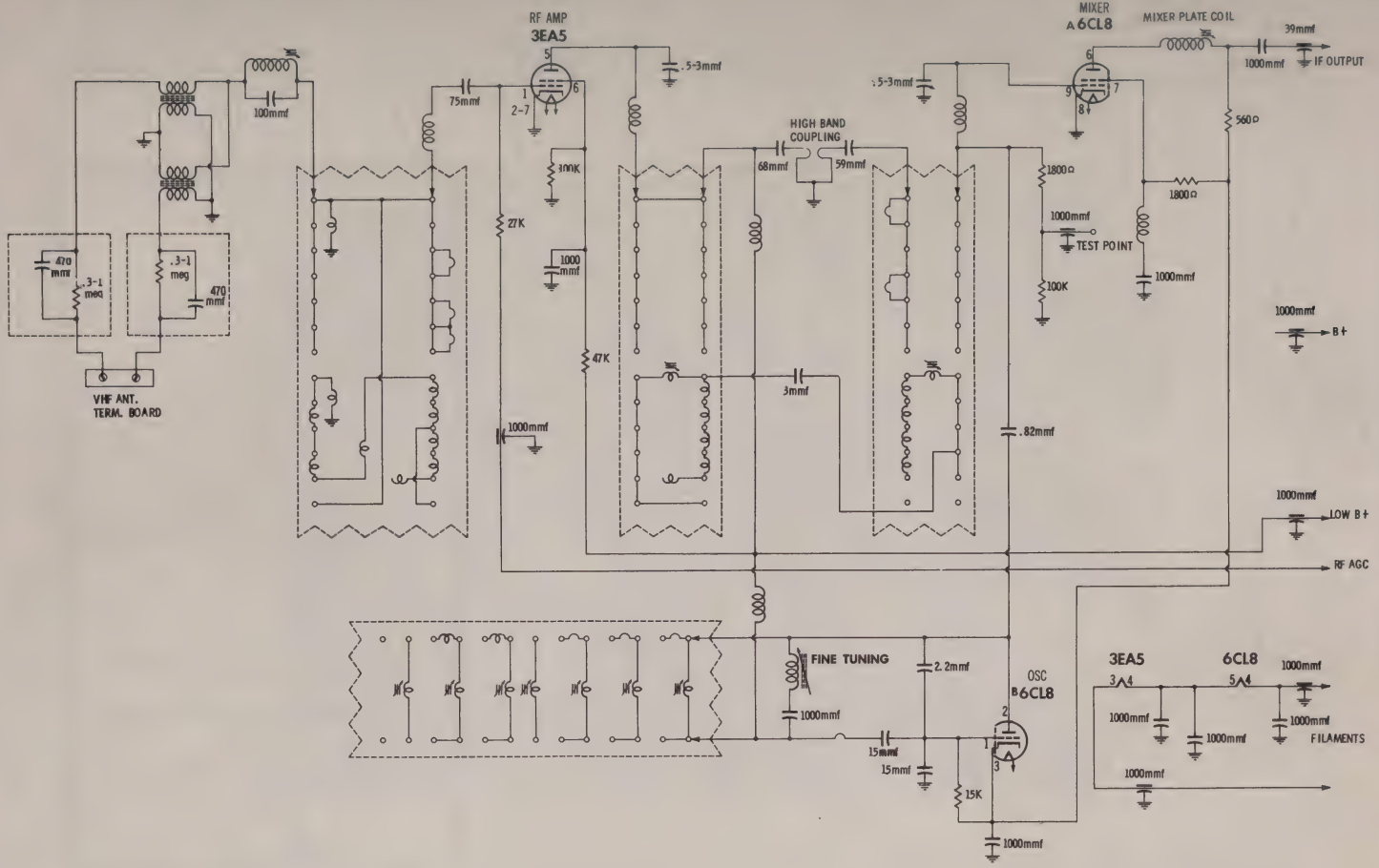
VHF TUNER With UHF Provisions - 470V066H01



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VHF TUNER 470V065H01

WESTINGHOUSE MODELS H-P3200, U, H-P3300, U, H-P3301, U (Ch. V-2384-1, V-2384-2)

TUNER PARTS LIST AND DESCRIPTIONS

472V035 H01

TUBES

• CBS • GENERAL ELECTRIC • RAYTHEON • SYLVANIA •					
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V301	UHF Osc.	3AF4A			

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C301	5		NPO-DI 5.0	DTZ-4R7	C10V5C	CCTO-050	CNO-547	10TCC-V50
C302	1.5 N150							
C303	5		NPO-SI 5.0	DTZ-4R7	C10V5C	CCTO-050	CNO-547	10TCC-V50
C304	.5 N750		NPO-SI .5	TCZ-R5				
C305								
C306								
C307	1000		EF-001	MFT-1000		CCF-102	CT280A	
C308	1000		EF-001	MFT-1000		CCF-102	CT280A	
C309	1000		EF-001	MFT-1000		CCF-102	CT280A	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

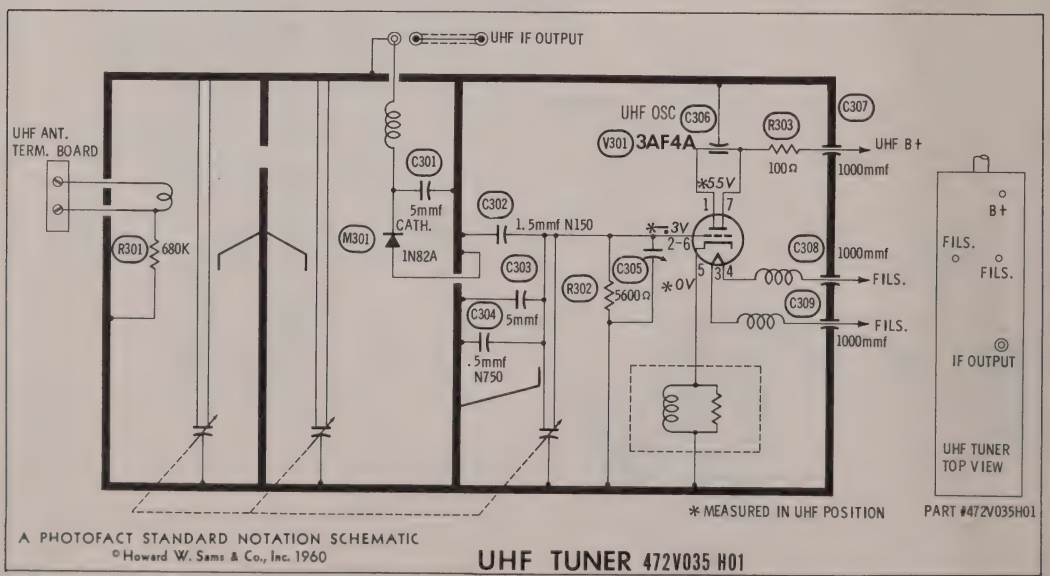
ITEM No.	RATING	REMARKS
R301	680K	

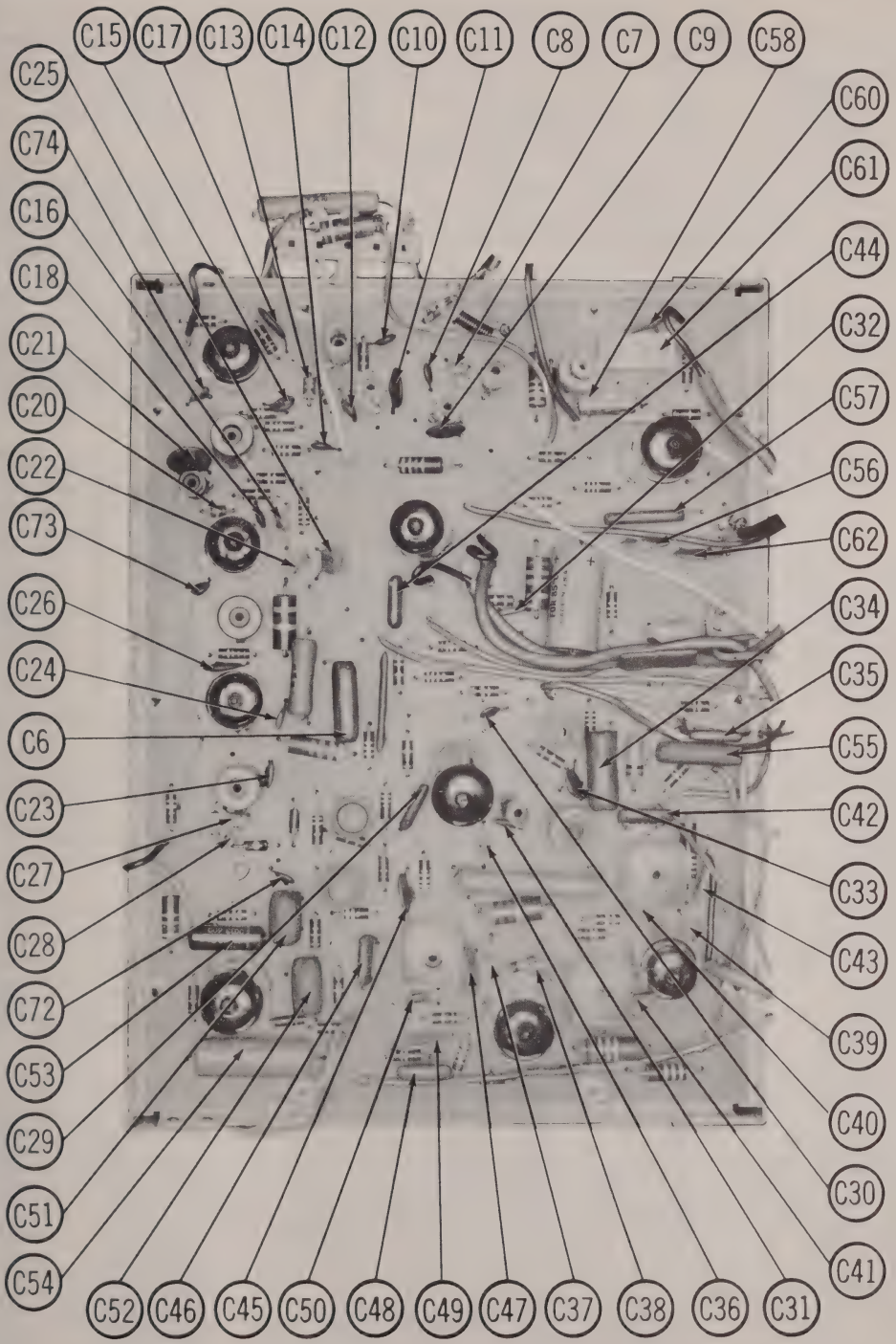
ITEM No.	RATING	REMARKS
R302	5600Ω	

ITEM No.	RATING	REMARKS
R303	100Ω	

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		Westinghouse PART No.	CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M301	1N82A		1N82A	1N82A	1N82A	





PRINTED BOARD - CAPACITOR IDENT.

SET 485 FOLDER 2

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	CBS • GENERAL ELECTRIC • USE	TYPE	ITEM No.	RAYTHEON • SYLVANIA • USE	TYPE
V1	1st Video IF Amp.	4BZ6	V7	Audio Output	6AQ5A
V2	2nd Video IF Amp.	4BZ6	V8	Vert. Mult. - Vert Output	6CS7
V3	3rd Video IF Amp.	6CB6 (4BZ6) *	V9	Horiz. Mult.	6CG7
V4	Video Output - Sync Amp.	8AW8A	V10	Horiz. Output	17DQ8A
V5	Sound IF - Sync Sep.	6FV8	V11	Damper	17DW4
V6	Audio Det.	6JT8	V12	HV Rect.	1G3GT

* Alternate

PICTURE TUBE

ITEM No	REPLACEMENT DATA: Westinghouse PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	NOTES
V13	17DEP4					

ELECTROLYTIC CAPACITORS

ITEM No	RATING: CAP	VOLT	REPLACEMENT DATA: Westinghouse PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1	180	300	21SV02H01	AFH5H-37-25	XAD366	FP51	TM9-34	TVL-1473	
C2A	180	350	21SV03H01	AFH5J-29-95		FP238.3	TMQ-190	TVL2-3628.5*	
B	60	300				W3427			
C	30	300							
C3A	100	6	21SV037H01 †	PR23230	BBR100-6	TT6X100	TDLD-14	TVA8-2300 *	
B	20	25			BBR25-25	TT25X20			
C4	4	300	21SV025H37	PR23550	BBR4-250	TC50X	TD-4-250	TVA-1501	
C5	30	450	21SV039H01	PR23740	BR3045	TC77	TD-30-450	TVA-1711	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.
† Alternate Part #21SV035H40.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA: AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C6	.22 200V		P388N-22		CUB3P22	4DP-S-224	GRM-3023	ZTM-P22
C7	4.7 N750 ± .25mmf		N750-D1 4.7	D7N-S	C10V47C	CCTN-050	CN7-547	10TCU-V47
C8	10 NPO 5%			DTZ-10	C10Q2		CN0-410	10TCC-Q10
C9	47 NPO 5%			DTZ-47	C10Q47C		CN0-447	10TCC-Q47
C10	10 NPO 5%			DTZ-10	C10Q2C		CN0-410	10TCC-Q10
C11	43 NPO 5%			DTZ-43	C10Q43C			
C12	800		BPD-0008	DD-801	L10T8	CCD-801	GP382	10T8-T80
C13	.75 5%							
C14	680		BPD-00068	DD-681	BYA10T68	CCD-681	GP368	10T8-T68
C15	800		BPD-0008	DD-801	L10T8	CCD-801	GP382	10T8-T80
C16	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C17	1500		BPD-0015	DD-152	BYA10D15	CCD-152	GP215	5HK-D15
C18	680		BPD-00068	DD-681	BYA10T68	CCD-681	GP368	10T8-T68
C19	.22 400V		P488N-22		CUB4P22	4DP-S-224	GRM-4023	4TM-P22
C20	2.2 5%		NPO-S1 2.2	TCZ-2R2	C10V22C	CCTO-2R2	CCN0-522	10TCC-V22
C21	68 NPO 10%		NPO-D1 68	DTZ-68	C10Q68C	CCTO-68	CCN0-469	10TCC-Q68
C22	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C23	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C24	560		DL-560	DD-561	L10T56	CCD-561	GP356	10T8-T56
C25	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C26	1500		BPD-0015	DD-152	BYA10D15	CCD-152	GP215	5HK-D15
C27	4.7 NPO ± .25mmf		NPO-D1 4.7	DTZ-4R7	C10V47C	CCTO-4R7	CN0-547	10TCC-V47
C28	6.8 NPO ± .5mmf		NPO-D1 6.8	DTZ-6R8	C10V68C	CCTO-6R8	CN0-568	10TCC-V68
C29	.033 200V		P388N-033	DD-303	CUB6S33	4DP-Z-333	GRM-4133	6TM-S33
C30	680		BPD-00068	DD-681	BYA10T68	CCD-681	GP368	10T8-T68
C31	56		DI-56	DD-560	L10Q56	CCD-560	GP456	10T8-Q56
C32	100 M150	#21V101A01				"		10TCP-T10
C33	39 N220	#21V013A90				"		10TCH-Q39
C34	.22 400V		P488N-22		CUB4P22	4DP-S-224	GRM-4023	4TM-P22
C35	.047 200V		P388N-047	DD-503	CUB3S47	4DP-S-473	GRM-4147	3TM-S47
C36	3.3 10%		NPO-S1 3.3	TCZ-3R3	C10V33C	CCTO-3R3	CN0-433	10TCC-V33
C37	4.7 10%		NPO-S1 4.7	TCZ-4R7	C10V47C	CCTO-4R7	CN0-547	10TCC-V47
C38	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C39	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C40	4700		BPD-0047	DD-472	BYA10D47M	CCD-472	GP247	5HK-D47
C41	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C42	.047 200V		P388N-047	DD-503	CUB3S47	4DP-S-473	GRM-4147	3TM-S47
C43	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C44	.01 600V		P688N-01	DD-103	CUB6S1	6DP-3-103	GEM-611	6TM-S1
C45	4700		BPD-0047	DD-472	BYA10D47M	CCD-472	GP247	5HK-D47
C46	.047 200V		P388N-047	DD-503	CUB3S47	4DP-S-473	GRM-4147	3TM-S47
C47	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S01
C48	.033 200V		P388N-033	DD-303	CUB6S33	4DP-Z-333	GRM-4133	6TM-S33
C49	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S01
C50	150		BPD-00015	DD-151	L10T15	CCD-151	GP315	10T8-T15
C51	.047 600V 10%		V6AC8047-10%		P688N47	6DP-3-473	GEM-10147	6TM-S47
C52	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1
C53	.0033 600V 10%		V6AC8033-10%		P68G33	6DP-1-333	GEM-16233	6TM-D33
C54	.015 1000V		P1088N-015	DD-153	CUB1QS15	16DP-4-153	GEM-10118	10TM-S15
C55	.33 200V		P288N-33		PM4P33	2DP-S-334	GRM-2033	2WF-P33
C56	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S01
C57	.1 200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P1
C58	1000 10%		1469-001		1R5DL	CM-19B-102K	MCB255	MS-2
C59	.22 400V		P488N-22		CUB4P22	4DP-S-224	GRM-4022	10TCR-Q68
C60	68 N220 10%					"		
C61	19-180					583		
C62	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S01
C63	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1
C64	190 5000V N1500 5%	#21SV300H51						
C65	680 2000V 10%	#21SV300H62						
C66	.047 600V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C67	.0068 600V		P688N-0068	DD-682	CUB6D68	6DP-1-682	GEM-6269	6TM-D68
C68	.033 600V		P688N-033	DD-303	CUB6S33	6DP-3-333	GEM-6133	6TM-S33
C69	1500 1400V		HVD-15-1500	DD-30-150V	HVD20D15	16DP-1-152	2HY-J15	30GA-D15
C70	1500 1400V		HVD-15-1500	DD-30-150V	HVD20D15	16DP-1-152	2HY-J15	30GA-D15
C71	.033 600V		P688N-033	DD-303	CUB6S33	6DP-3-333	GEM-6133	6TM-S33
C72	680		BPD-00068	DD-681	BYA10T68	CCD-681	GP368	10T8-T68
C73	680		BPD-00068	DD-681	BYA10T68	CCD-681	GP368	10T8-T68

PARTS LIST AND DESCRIPTIONS

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA: AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C74	680		BPD-00068	DD-681	BYA10T68	CCD-681	GP368	10T8-T68
C75	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1

Westinghouse Part Number.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No.	RATING: RESISTANCE	WATTS	REPLACEMENT DATA: Westinghouse PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500K		27SV078H01					Brightness
B	500K						■UE4115-8	Volume
C	Switch							Push Pull Off-On
R2A	60K		27SV077H01	F1-30				Horiz. Hold
B	2meg			R2-67	(RTV-700	(X)-1261	▲UE4116	Vert. Hold
R3A	15K		27SV080H01	AB-30	A47-15K-8	B11-118	U36	Contrast
B	Shaft			AK-8	Not Req.	S83	DS-37	
R4A	5meg		27SV038H06	AB-87	B47-5meg-8	B11-141	PTA56L	Vert. Height
B	Shaft			AK-1	Not Req.	TM4	Not Req.	
R5A	500K		27SV038H05	AB-59	B47-500K-8	B11-133	PTA55L	Vert. Linearity
B	Shaft			AK-19	Not Req.	TM4	Not Req.	

■ "STA-LOC" Equivalent: FA55L, RUP55A, OS1000A.
▲ "STA-LOC" Equivalent: FA75L, RU26L, OS1000A, IS500.
† "Concentrictr" Equivalent: K-6 kit with base elements and shafts: B11-125, P17-031 (Panel) (Not available as a factory assembled unit.) B11-139, R1-113 (Rear)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R6	5100Ω	
R7	6800Ω	(8200Ω) *
R8	15K	
R9	270Ω	
R10	47Ω	
R11	33Ω	
R12	470K	
R13	100K	
R14	470K	
R15	2700Ω 2W	
R16	10K 2W	
R17	12Ω	
R18	47K 1W	
R19	150Ω	
R20	5600Ω	
R21	3900Ω	
R22	1meg	
R23	3900Ω 5W	#21V014H31
R24	18K 2W	
R25	1500Ω 2W	
R26	47Ω	
R27	2700Ω	
R28	5600Ω	
R29	15K	
R30	100K	(270K) *
R31	470K	
R32	100K	
R33	100K 1W	(68K) *

ITEM No.	RATING	REMARKS
R34	22K	(10K) *
R35	820Ω	
R36	680K 1W	
R37	120K	
R38	560K	
R39	33K 1W	
R40	330Ω 1W	
R41	390K	
R42	1.2meg	
R43	12meg	
R44	68K 2W	
R45	22K	
R46	2700Ω	
R47	3.3meg	
R48	680K	
R49	1meg	
R50	220K	
R51	1meg	
R52	470K	
R53	100K	
R54	33K	
R55	180K	
R56	82K 1W	
R57	180K	
R58	15K	
R59	150K	
R60	1meg	
R61	150Ω	

ITEM No.	RATING	REMARKS
R62	100Ω	
R63	1meg	
R64	680K	
R65	22K	
R66	560Ω	
R67	560Ω	
R68	680K	
R69	47K	
R70	39K 1W	
R71	100K	
R72	10K	
R73	1000Ω	
R74	180K	
R75	56K	
R76	470K	
R77	150Ω	
R78	15K 3W	
R79	4700Ω 1W	
R80	5000Ω 7W	#21V020H03
R81	3.3Ω	
R82	5Ω (Cold)	#250V225A61
R83A	7.5Ω 15W	#21V027H03
B	30Ω 10W	
R84	1500Ω 2W	
R85	1800Ω 2W	
R86	12K 4W	#250V014H22

Westinghouse Part Number * Alternate Value

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	Westinghouse PART No.	REPLACEMENT DATA
K1	Vert. Integrator	2000mmf, 4700mmf, 5000mmf, 5000mmf, 8200Ω, 8200Ω, 22K	21SV029H01	
K2	Horiz. AFC	33mmf, 47mmf, 150mmf, 390mmf, 680mmf, 10K, 12K, 680K, 1meg	21SV028H04	
K3	Chassis Isolation	1000mmf (1000V), 350K	21SV004H03	Sprague ACI-8

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA: Westinghouse PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	RF Choke	23SV065H01	19-3002	19-3002		4582		.18uh
L2	41.25MC Trap	23SV068H03	19-1044	20-1044	TV-131	6226	VF-4	
L3	47.25MC Trap	23SV078H02	17-4538	17-4538	TV-153	6225		
L4	1st Video IF	23SV068H01	17-4533	17-4533	TV-130	6219	VF-3	
L5	47.25MC Trap	23SV078H01	17-4538	17-4538	TV-153	6225		
L6	2nd Video IF	23SV048H01						
L7	39.75MC Trap	23SV070H01	17-4538	17-4538	TV-153	6225		
L8	3rd Video IF	23SV048H01						
L9	4th Video IF	23SV048H03						
L10	RF Choke	23SV019H15	19-1006	19-1006		4634		14uh
L11	RF Choke	23SV019H15	19-1006	19-1006		4634		14uh
L12	RF Choke	23SV019H04	19-1008	19-1008	SW-531	4609		4.7uh Note 1
L13	Series Peaking Coil	23SV034H06	19-4201	19-4301	TV-197	6154		200uh
L14	Shunt Peaking Coil	23SV034H05	19-4301	19-4301	TV-197	6154		200uh
L15	4.5MC Trap	23SV030H03						
L16	Series Peaking Coil	23SV034H03	19-3125	19-3125	TV-196	6130	VF-5	140uh
L17	Shunt Peaking Coil	23SV034H04	19-3500	19-3500	TV-188	6174	VF-8	800uh
L18	1st Sound IF	23SV083H01						
L19	2nd Sound IF	23SV046H01						
L20	Quadrature Coil	23SV031H01						
L21	RF Choke	23SV019H10	19-1006	19-1006		4634		14uh

Note 1. Not used in some versions

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: Westinghouse PART No.	Halldorson PART No.	Merit PART No.	Miller PART No.	Ram PART No.	Thordarson PART No.	NOTES
L22	82Ω		23SV032H01						Horiz. Stabilizer

FILTER CHOKE

ITEM No.	RATINGS: CURRENT (Measured)	DC RES.	INDUCTANCE @ CURRENT 1000 (%)	REPLACEMENT DATA: Westinghouse PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L23	.200A	23Ω	.5 Hy.	43SV084H01				C-2343	26C43	C-27X

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: Westinghouse PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Rogers PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	Vert. Output	43SV005H05	26S75 ①	A-2815 ①	V312 ②		VO-109 ①	26S75 ①	A-114X
T2	Alt. Vert. Output	43SV005H04	26S75 ①	A-2815 ①	V312 ②		VO-109 ④	26S75 ①	A-114X
	Yoke-Horiz. (21MH)	49SV007H01	Y-53 ③					Y-53 ③	Y-62 &
	(110)-Vert. (32MH)		④					④	NW-1 ④
	Rear Cover and Centering Device	78SV044H03							YC-110 & CL-1
	Yoke Clamp	78SV014H03							
T3	Horiz. Output	49SV007H01	FLY-95⑤ * ‡	HVO-154 ⑤ * ‡	X64 ⑤ * ‡			FLY-95 ⑤ * ‡	D-154 ⑤ * ‡

① Use 16 to 1 turns ratio.
② Remove Green lead of yoke from ground. Connect Blue lead to plate; Red to boost "B+" (320V) and to Orange lead of yoke; Green to Green lead of yoke.
③ Use original rear cover and centering device.
④ Connect same as original.
⑤ Use original mounting plate.
‡ This part may be superceded by Parts Manufacturer's introduction of special unit for this application.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

ORIGINAL TERMINAL (CONNECTIONS)	Halldorson Replacement Connections	Merit Replacement Connections	Ram Replacement Connections	Rogers Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
7	6	6	6		6	6	6
5	4	4	4		4	4	4
4	T	T	T		T	T	T
3	3	3	3		3	3	3

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA: Westinghouse PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T4	5200Ω	3-4Ω	43SV088H01	24S41 ①	A-3026	AU-601 ①	A-3877 ①	24S51 ①	S-6X	① Drill new mounting hole.

SPEAKER

ITEM No.	TYPE: SIZE	FIELD	V. C. IMP.	REPLACEMENT DATA: Westinghouse PART No.	QUAM PART No.	NOTES
SP1	3" x 5" PM 4" PM		3-4Ω	57SV069H01 57SV075H01	35A0526	Used in Models H-P3300, U, H-P3301, U Used in Models H-P3200, U

RECTIFIERS

ITEM No.	RATING: CURRENT (Measured)	REPLACEMENT DATA: Westinghouse PART No.	INTERNATIONAL PART No.	ITT PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M1	.230A	29SV006H03 *	SK4 *	HA504 *	40K *	SR500 *	* Silicon Rectifier
M2	.230A	29SV006H03 *	SK4 *	HA504 *	40K *	SR500 *	+ Dual Selenium Diode
M3		29SV064H01 +	1T1 * ▲	K1615 *			▲ 2 Required

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA: Westinghouse PART No. FUSE	HOLDER	LITTELFUSE PART No. FUSE	HOLDER	BUSS PART No. FUSE	HOLDER
M4	3AG	3/4A 250V (3/4A 250V) (8/8 P/T)	75SV003H17		315. 750 (3/4A 250V) (8/8 P/T)		MDV 3/4	

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA: Westinghouse PART No.	CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	NOTES
M5	1N295 †	29SV006H01	1N295	1N295	1N295	Video Det. (Pigtail) † Alternate 1N87A

WESTINGHOUSE MODELS H-P3200, U, H-P3300, U; H-P3301, U (Ch. V-2384-1, V-2384-2)

FOLDER 2

PARTS LIST AND DESCRIPTIONS (Continued)

MISCELLANEOUS

ITEM No.	PART NAME	Westinghouse PART No.	NOTES
M6	Tuner	470V066H01	VHF with UHF Provisions, Models H-P3200U, H-P3300U, H-P3301U
M7	Tuner	472V035H01	UHF, Models H-P3200U, H-P3300U, H-P3301U
	Tuner	470V065H01	VHF, Models H-P3200, H-P3300, H-P3301
M8	Antenna	318V007H02	Right Monopole, Models H-P3300, 3301, U, JFD type #TA374R
		319V007H03	Left Monopole, Models H-P3300, 3301, U, JFD type #TA374L
	Antenna	318V006H01	Models H-P3200, U, JFD type #TA372
M9	Circuit Breaker	753V006H01	
	Printed Board	350V082H01C	

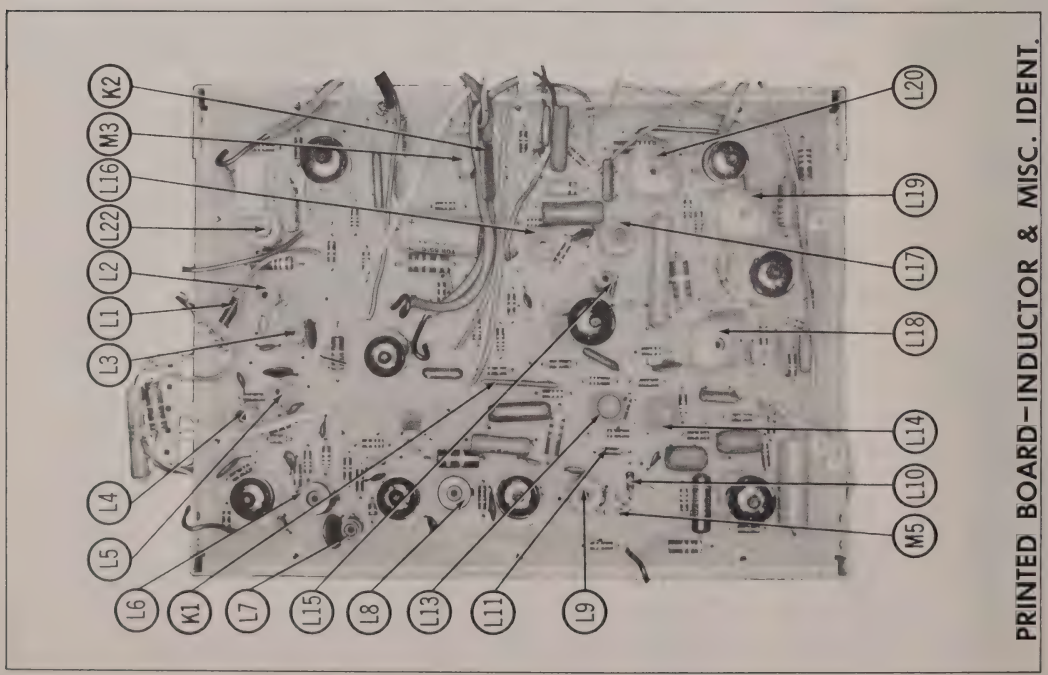
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Mask	610V016H01	Model H-P3200
Mask	610V016H02	Model H-P3300, H-P3301
Knob	550V125H01	Channel Selector, VHF
Knob	550V134H01	Channel Selector, UHF
Knob	550V123H01	Vert., Off-On, Contrast (Inner)
Knob	550V124H01	Horizontal Hold, Brightness (Outer)
Knob	550V124H02	Contrast (Outer)
Knob	559V080H01	Fine Tuning, Later Production Models
Dial	550V130H01	UHF
Cabinet	510V018H01	Model H-P3200
Cabinet	510V018H02	Model H-P3200U
Cabinet	510V019H01	Model H-P3300
Cabinet	510V019H02	Model H-P3300U
Cabinet	510V019H03	Model H-P3301
Cabinet	510V019H04	Model H-P3301U
Handle	787V196H01	Model H-P3200
Handle	787V197H01	Models H-P3300, H-P3301

WIRING DATA

High Voltage Lead	Use BELDEN No.	8869
Shielded Hook-up Wire	Use BELDEN No.	8885 (Single Conductor)
		8738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No.	8530 (Solid) Available in Ten Colors
		8524 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No.	8874
300Ω Tuner Input Lead	Use BELDEN No.	8225
300Ω Antenna Lead-in	Use BELDEN No.	8230 or 8275
Antenna Rotor Cable	Use BELDEN No.	8464 (Flat) or 8484 (Round) - 4 Conductor
		8485 (Round) - 5 Conductor
		8488 (Round) - 8 Conductor



PRINTED BOARD—INDUCTOR & MISC. IDENT.

TUNER PARTS LIST AND DESCRIPTIONS

470V066H01

TUBES

• CBS • GENERAL ELECTRIC • RAYTHEON • SYLVANIA •					
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V201	RF Amp.	3EA5	V202	Mixer-Osc.	6CL8A

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C201	20		NPO-DI 20	DTZ-20	C10Q2C	CCTO-200	CNO-422	10TCC-Q20
C202	100		NPO-DI 100	DTZ-100	C10T1C	CCTO-101	CNO-310	10TCC-T10
C203	75 N1500					*		
C204	1000		EF-001	MFT-1000		CCF-102	CT280A	
C205								
C206	1000		DI-1000	DD-102	BYA10D1	CCD-102	GP210	10TS-D10
C207	.47 10%		NPO-SI .5	TCZ-R5				
C208	3 10%		NPO-SI 3.0	TCZ-3R3	C10V3C	CCTO-3R3	CNO-533	10TCC-V33
C209	68		NPO-DI 68	DTZ-68	C10Q68C	CCTO-680	CNO-468	10TCC-Q68
C210	59							
C211								
C212	1000		EF-001	MFT-1000		CCF-102	CT280A	
C213	1000		DI-1000	DD-102	BYA10D1	CCD-102	GP210	10TS-D10
C214	1000		EF-001	MFT-1000		CCF-102	CT280A	
C215	1000		DI-1000	DD-102	BYA10D1	CCD-102	GP210	10TS-D10
C216	.82 10%							
C217	2.2 N1500							
C218	1000		DI-1000	DD-102	BYA10D1	CCD-102	GP210	10TS-D10
C219	15 NPO		NPO-DI 15	DTZ-15	C10Q15C	CCTO-150	CNO-415	10TCC-Q15
C220	15 NPO		NPO-DI 15	DTZ-15	C10Q15C	CCTO-150	CNO-415	10TCC-Q15
C221	1000		DI-1000	DD-102	BYA10D1	CCD-102	GP210	10TS-D10
C222	800		BPD-0008	DD-801	L10T8	CCD-801	GP382	10TS-T80
C223	1000		EF-001	MFT-1000		CCF-102	CT280A	
C224	1000		DI-1000	DD-102	BYA10D1	CCD-102	GP210	10TS-D10
C225	1000		DI-1000	DD-102	BYA10D1	CCD-102	GP210	10TS-D10
C226	1000		EF-001	MFT-1000		CCF-102	CT280A	
C227	1000		EF-001	MFT-1000		CCF-102	CT280A	
C228	1000		EF-001	MFT-1000		CCF-102	CT280A	
C229	1000		DI-1000	DD-102	BYA10D1	CCD-102	GP210	10TS-D10

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R201	27K	
R202	47K	
R203	100K	
R204	470Ω	

ITEM No.	RATING	REMARKS
R205	390Ω	
R206	1800Ω	
R207	100K	
R208	1800Ω	

ITEM No.	RATING	REMARKS
R209	560Ω	
R210	15K	
R211	27K 1W	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	Westinghouse PART No.	REPLACEMENT DATA	
K201	Antenna Filter	470mmf, .3-1meg		Centralab Sprague	RC-471 AC1-1
K202	Antenna Filter	470mmf, .3-1meg		Centralab Sprague	RC-471 AC1-1

MISCELLANEOUS

ITEM No.	PART NAME	Westinghouse PART No.	NOTES
	Drive Assy. Bracket Assy.	787V187H01 787V202H01	Channel Selector UHF Complete

TUNER ALIGNMENT INSTRUCTIONS

Suggested Alignment Tools: GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8729, 8987, 8988, 8989
WALSCO #2515, 2531, 2532

VHF OSCILLATOR ALIGNMENT

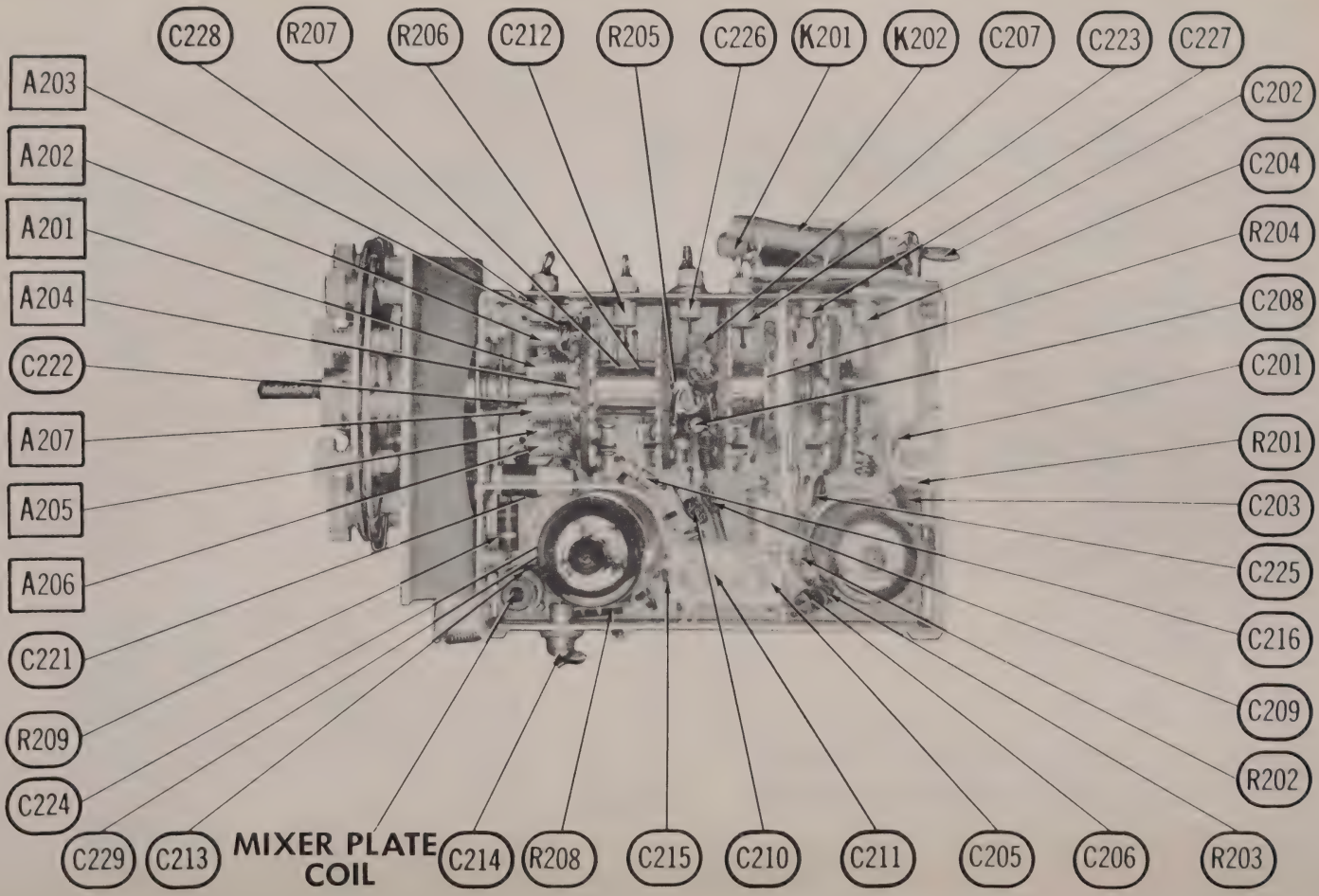
Set the Fine Tuning to the center of its range. Set the Channel Selector to the highest channel operating in the area and adjust the appropriate slug for best picture and sound. Each channel operating in the area must be adjusted for in descending order from the highest to the lowest. A201 for channels 13 and 12, A202 for channels 11 and 10, A203 for channels 9 and 8, A204 for channel 7, A205 for channels 6 and 5, A206 for channels 4 and 3, and A207 for channel 2.
If difficulty is experienced in adjusting for channels 12, 10, 8, 5 or 3, adjust the correct coil by expanding or compressing coil turns.

VHF RF AND MIXER ALIGNMENT

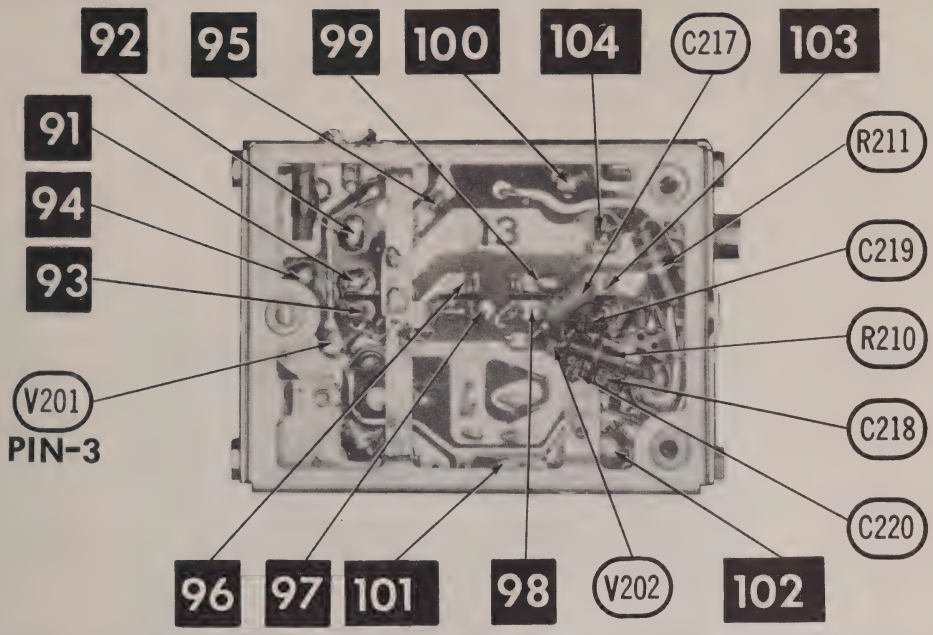
This portion of the tuner has been properly aligned at the factory and is very stable. Alignment of this portion should not be attempted in the field.

UHF TUNER ALIGNMENT

This portion of the tuner has been properly aligned at the factory and is very stable. Alignment of this portion should not be attempted in the field.



VHF TUNER With UHF Provisions 470V066H01 - TOP VIEW



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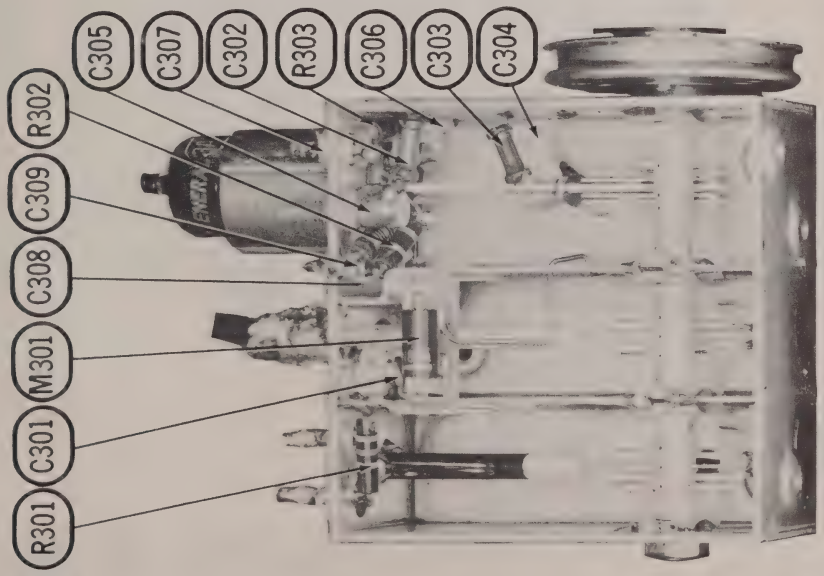
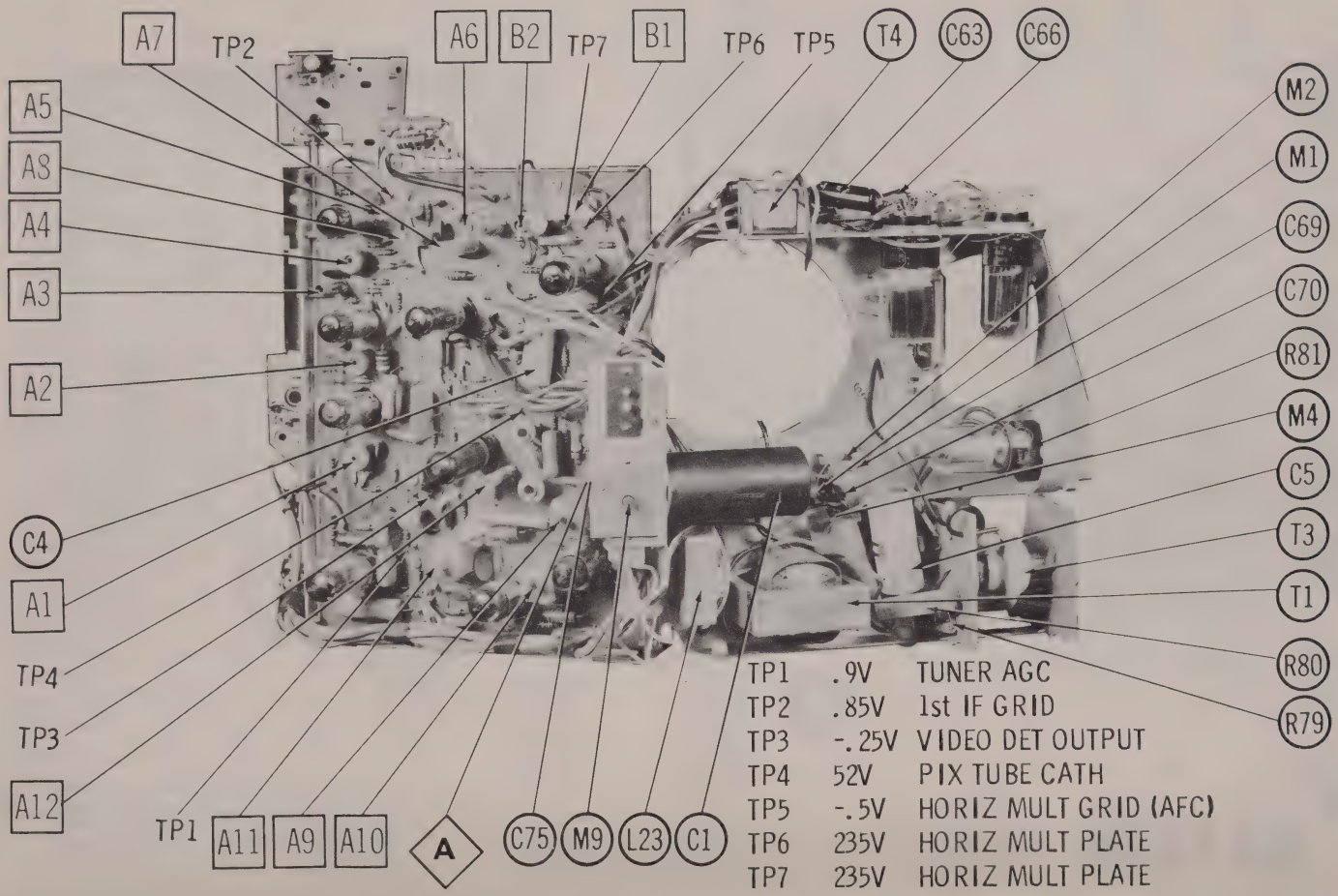
ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED

VHF TUNER With UHF Provisions 470V66H01 - BOTTOM VIEW

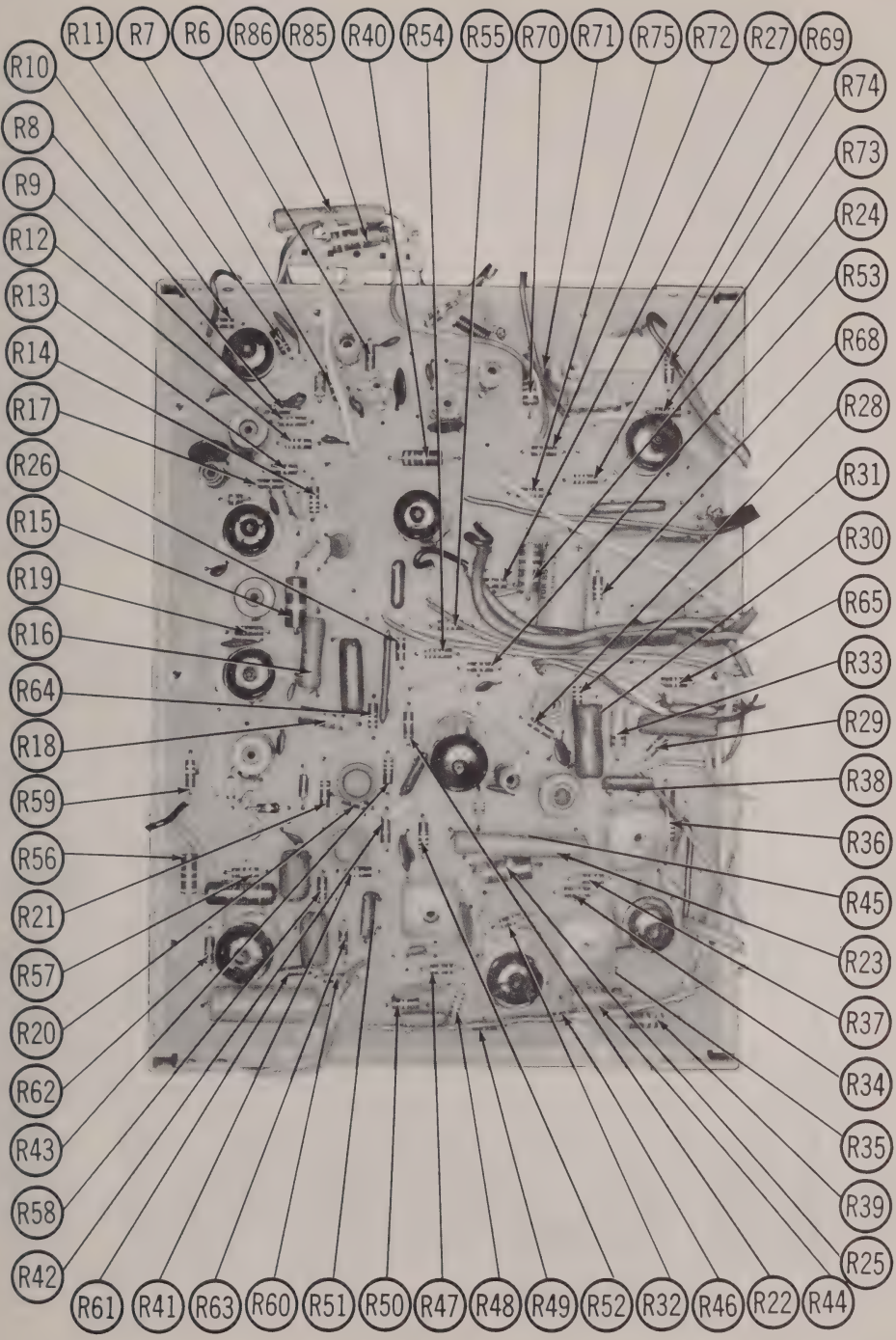


UHF TUNER 472V035H01



TP1	.9V	TUNER AGC
TP2	.85V	1st IF GRID
TP3	-.25V	VIDEO DET OUTPUT
TP4	52V	PIX TUBE CATH
TP5	-.5V	HORIZ MULT GRID (AFC)
TP6	235V	HORIZ MULT PLATE
TP7	235V	HORIZ MULT PLATE

CHASSIS - TOP VIEW

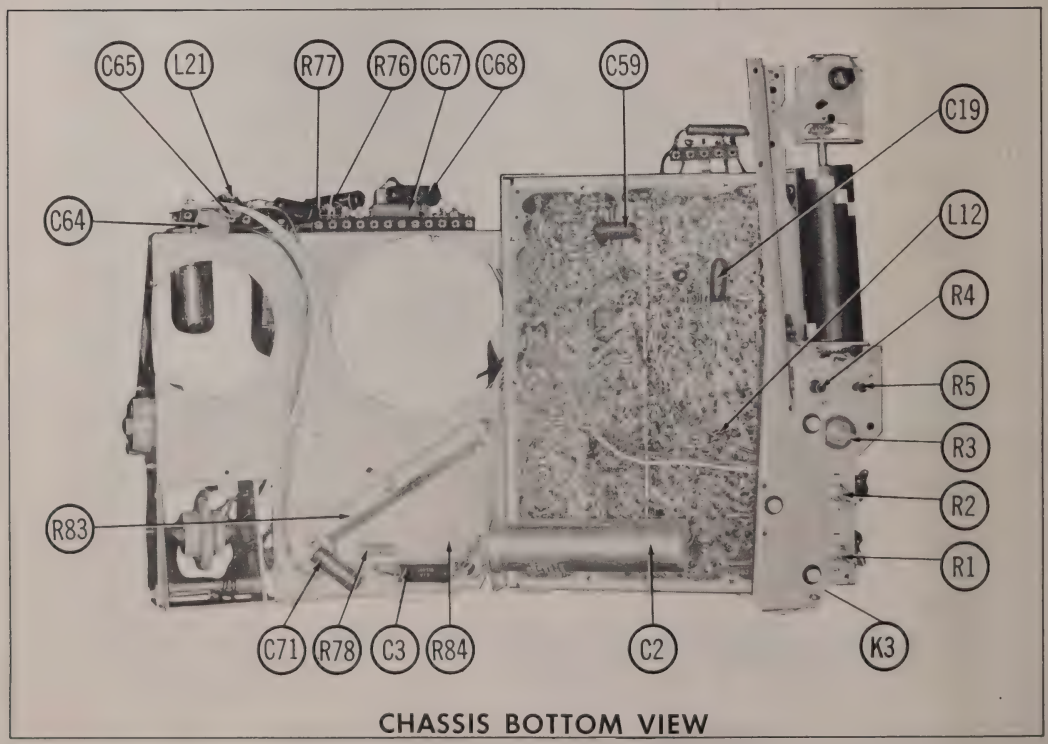


PRINTED BOARD - RESISTOR IDENT.

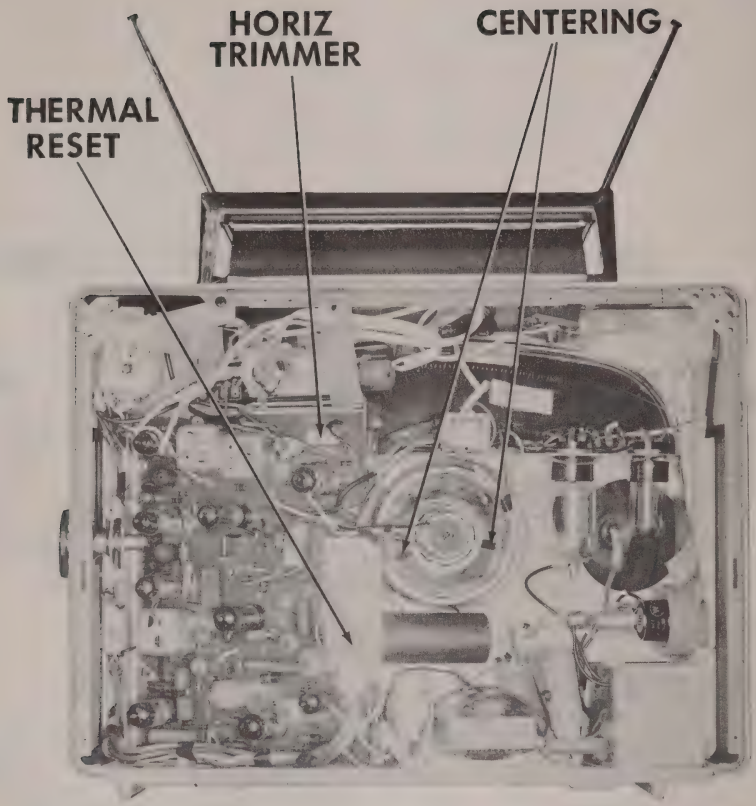
RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	4BZ6	390K	80Ω	7.5Ω	9Ω	▲ 270Ω	▲ 270Ω	0Ω		
V2	4BZ6	280K	▲ 12Ω	9Ω	10.5Ω	† 2700Ω	† 2700Ω	INF		
V3	4CB6	.2Ω	150Ω	10.5Ω	12Ω	† 10K	† 47K	0Ω		
V4	8AW8A	0Ω	1.4meg	† 80K	19.5Ω	23Ω	47Ω	1meg	† 18K	† 5000Ω
V5	6FV8	1.8meg	† 27K	2700Ω	16Ω	18Ω	† 45K	† 45K	0Ω	100K
V6	4DT6	3.9Ω	820Ω	18Ω	19.5Ω	† 685K	† 33K	560K		
V7	6AQ5A	0Ω	330Ω	24.5Ω	23Ω	† 1900Ω	† 1500Ω	0Ω		
V8	8CS7	†6300Ω	NC	● 1.2meg	16Ω	12Ω	† 550K	● 1.3meg	0Ω	100Ω
V9	8CG7	† 56K	● 210K	1000Ω	1.5Ω	4.5Ω	† 49K	2.4meg	1000Ω	0Ω
V10	17DQ6A	NC	24.5Ω	NC	† 15K	470K	NC	28Ω	0Ω	TOP CAP †31Ω
V11	17D4GT	NC	NC	¶ 2meg	NC	† 1.3Ω	NC	28Ω	32Ω	
V12	1G3GT	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP †666Ω
V13	17DHP4	0Ω	22K	†20K	0Ω	NC	NC	● 150K	1.5Ω	
V201	3EA5	420K	0Ω	6.5Ω	7.5Ω	† 1800Ω	† 49K	0Ω		
V202	6CL8A	•15K	† 1800Ω	INF	5Ω	6.5Ω	♦ 560Ω	♦ 1800Ω	0Ω	100K
V301	3AF4A	† * 1900Ω	5600Ω	4.5Ω	5Ω	.5Ω	5600Ω	† * 1900Ω		
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
● THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
† MEASURED FROM 265V SOURCE.
▲ MEASURED FROM PIN 7 OF V2.
† MEASURED FROM PIN 3 OF V11.
♦ MEASURED FROM PIN 3 OF V202.
* MEASURED IN UHF POSITION.
NC NO CONNECTION.



CHASSIS BOTTOM VIEW



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

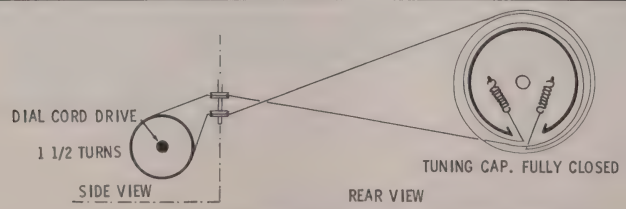
Connect a short clip lead across the Horizontal Frequency coil (L22).

Set the Horizontal Hold control to the center of its range.

Connect the DC probe of a VTVM to TP-5. Common to chassis.

Tune in a TV station and adjust the Horizontal Oscillator trimmer (B1) for zero volts on the VTVM. If zero can be approached but not reached, set the Horizontal Hold control slightly to one side of center for zero voltage.

Remove the jumper from L22 and adjust the Horizontal Frequency slug (B2) for zero reading on the meter. Check lock-in action by switching from channel to channel. The picture should pull into synchronization on all channels.



UHF DRIVE CORD STRINGING

PHOTOFACT® Folder with CIRCUITRACE*

*TRADE MARK

ARVIN MODEL 2598
(Ch. 1.47900)

ARVIN MODEL 2598
(Ch. 1.47900)

ARVIN MODEL 2598
(Ch. 1.47900)

TRADE NAME	Arvin Model 2598 (Ch. 1.47900)
MANUFACTURER	Arvin Industries, Inc., Columbus, Indiana
TYPE SET	Battery Operated Transistorized Portable AM Receiver
POWER SUPPLY	9 Volts DC
RATING	7MA @ 9 Volts DC (No Signal, Min. Volume) 14 MA @ 9 Volts DC (Signal, Normal Volume)
TUNING RANGE—BROADCAST	540 — 1670KC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested alignment tools:
A1, A2, A3.....GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8729, 8987, 8988, 8989
WALSCO #2515, 2531, 2532
A4, A5.....GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520
A6.....GENERAL CEMENT #8282, 8606, 8606-L, 9295, 9440
WALSCO #2526, 2543, 2544, 2545

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	High side thru .05mfd to antenna stator lug of tuning gang. Low side to chassis.	455KC (400~ Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2, A3	Adjust for maximum output.
2.	Loop	1670KC	"	"	A4	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.	"	1400KC	Tune to 1400KC Signal.	"	A5	"
4.	"	600KC	Tune to 600KC Signal.	"	A6	Adjust for maximum output while rocking tuning gang.

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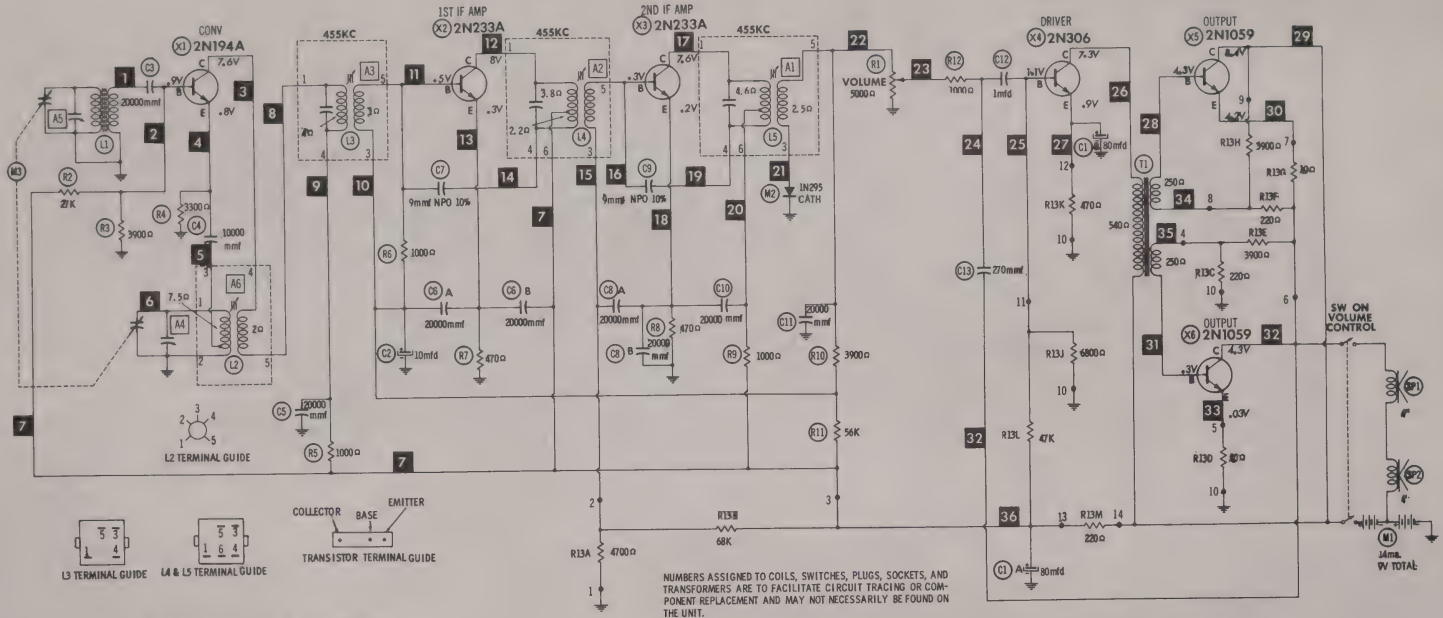
JG740

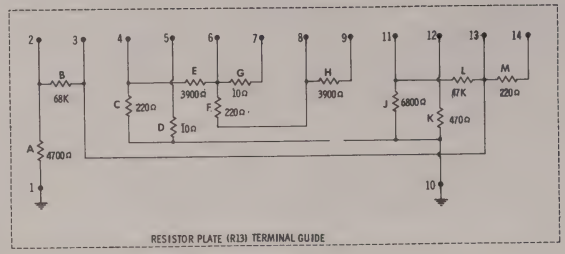
SET 485 FOLDER 3



NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

RESISTANCE MEASUREMENTS NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.



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with CIRCUITRACE®

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ARVIN MODEL 2598
(Ch. 1.47900)

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA				NOTES
			CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2N194A	Converter	2N438		2N1366	2N194A	NPN
X2	2N233A	1st IF Amplifier	2N438		2N1367	2N233A	NPN
X3	2N233A	2nd IF Amplifier	2N438		2N1367	2N233A	NPN
X4	2N306	Driver	2N306	2N649		2N306	NPN
X5	2N1059	Output	2N444	2N649		2N1059	NPN } Matched
X6	2N1059	Output	2N444	2N649		2N1059	NPN } Pair

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	ARVIN PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1A	80	12	44397-3	BCD10X8080	ECPAN14		TDLD-13	VL-2350	
B	80	12							
C2	10	10	44396-4	PWE10010	ECPB408	TT12X10	ML10-15	TE-1114	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C3	20000		BPD-02	DD-203	BYB6S2	CCD-203	GP120	5HK-S20
C4	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C5	20000		BPD-02	DD-203	BYB6S2	CCD-203	GP120	5HK-S20
C6A	20000		BPD-2X02	DD-203	BYB6S2	CCD-203	GP120	5HK-2S20
B	20000			DD-203	BYB6S2	CCD-203	GP120	
C7	9 NPO 10%		NPO-DI 10	DTZ-10	C10V9C	CCTO-100	CNO-410	10TCC-Q10
C8A	20000		BPD-2X02	DD-203	BYB6S2	CCD-203	GP120	5HK-2S20
B	20000			DD-203	BYB6S2	CCD-203	GP120	
C9	9 NPO 10%		NPO-DI 10	DTZ-10	C10V9C	CCTO-100	CNO-410	10TCC-Q10
C10	20000		BPD-02	DD-203	BYB6S2	CCD-203	GP120	5HK-S20
C11	20000		BPD-02	DD-203	BYB6S2	CCD-203	GP120	5HK-S20
C12	lmfd			UK-105	MP2W1		GEM-21	HY135
C13	270		DI-270	DD-271	L10T27	CCD-271	GP327	10TS-T27

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	ARVIN PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	5000Ω	½	44500-27	B-11	A47-5000-S	Q13-114	U12	Volume
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
C	Switch			KR-2	SWE-20	76-2	US-27	Power Off-On

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R2	27K	
R3	3900Ω	
R4	3300Ω	
R5	1000Ω	
R6	1000Ω	
R7	470Ω	
R8	470Ω	
R9	1000Ω	

ITEM No.	RATING	REMARKS
R10	3900Ω	
R11	56K	
R12	1000Ω	
R13A	4700Ω	
B	68K	
C	3900Ω	#47354-1
D	220Ω	
E	470Ω	

ITEM No.	RATING	REMARKS
F	6800Ω	
G	3900Ω	
H	220Ω	
I	10Ω	
J	10Ω	
K	47K	
L	220Ω	

Arvin Part Number.

PRINTED BOARD

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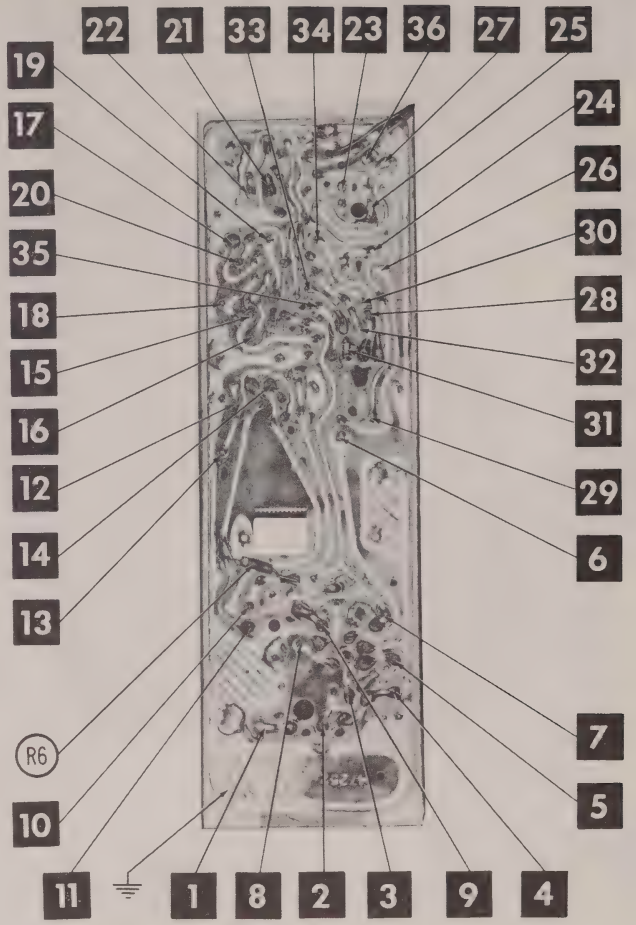


ARVIN MODEL 2598
(Ch. 1.47900)

FOLDER 3

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		ARVIN PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Loopstick	46861-3	14-9013	14-9013				
L2	Osc. Coil	45783-8						
L3	1st IF Trans.	45900-11						
L4	2nd IF Trans.	45900-12						
L5	3rd IF Trans.	45900-13						

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA						NOTES
	PRI.	SEC.	ARVIN PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1		1	45604-4						
		SEC. 2							
	3.5	1							

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	ARVIN PART No.	QUAM PART No.	
SP1	4"	PM	16-18Ω	45600-8	4AIRZ16.5	
SP2	4"	PM	16-18Ω	45600-8	4AIRZ16.5	

BATTERIES

ITEM No.	VOLTAGE	ARVIN PART No.	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
			"A"	"B"	"A"	"B"	"A"	"B"	
M1	1.5V			230 *		A100 *		M-13R *	* 6 Required

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		ARVIN PART No.	CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M2	1N295	1N295	1N295	1N295	1N295	Detector (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	ARVIN PART No.	NOTES
M3	Tuning Cap.	47314	2 Gang

CABINETS & CABINET PARTS

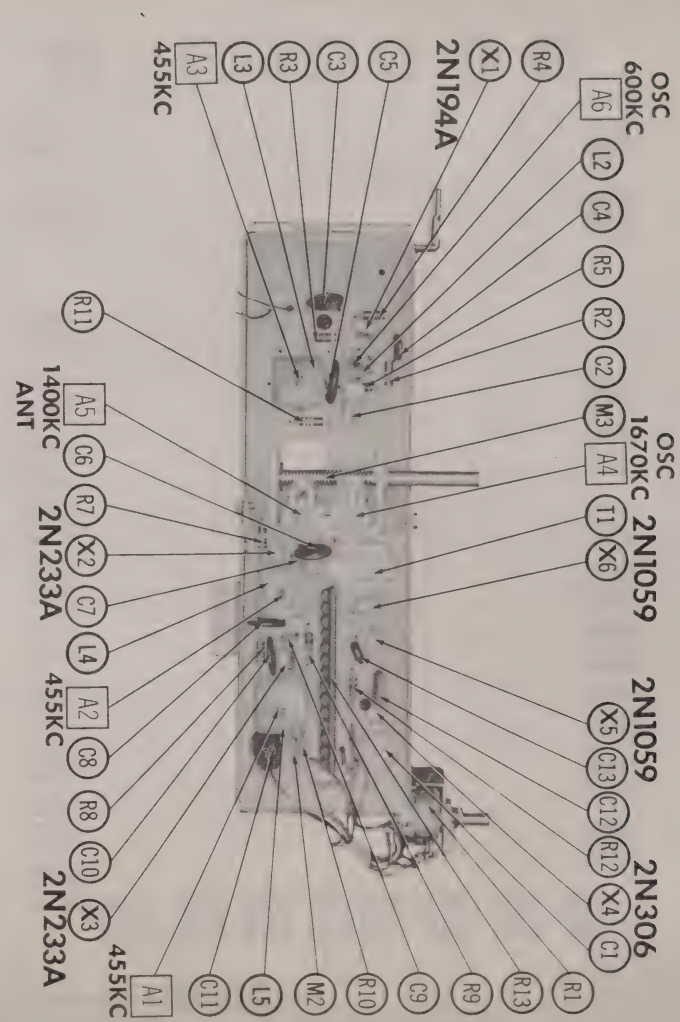
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	47240	Tuning
Knob	45468-67	Volume
Cabinet	47236-67	Front Assembly, Includes Nameplate & Dial Scale
Cabinet Back	45433-192	Charcoal
Battery Door	45543-19	Charcoal

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

CHASSIS—TOP VIEW



PHOTOFACT® Folder with CIRCUITRACE®

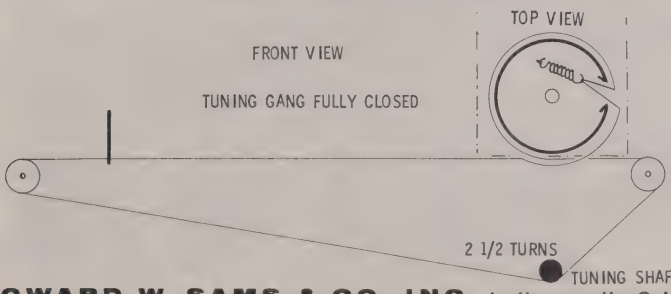
ARVIN MODEL 9598
(Ch. 1.47700)

ARVIN MODEL 9598
(Ch. 1.47700)

ARVIN MODEL 9598
(Ch. 1.47700)

TRADE NAME	Arvin Model 9598 (Ch. 1.47700)		
MANUFACTURER	Arvin Industries, Inc., Columbus, Indiana		
TYPE SET	Battery Operated Transistorized Portable BC-SW-LW Receiver		
POWER SUPPLY	12 Volts DC	RATING	9 MA @ 12 Volts DC (No Signal, Min. Volume) 15 MA @ 12 Volts DC (Signal, Normal Volume)
TUNING RANGE	BROADCAST 540-1630KC	SHORT WAVE	2.1-6.3MC LONG WAVE 180-425KC

DIAL CORD STRINGING



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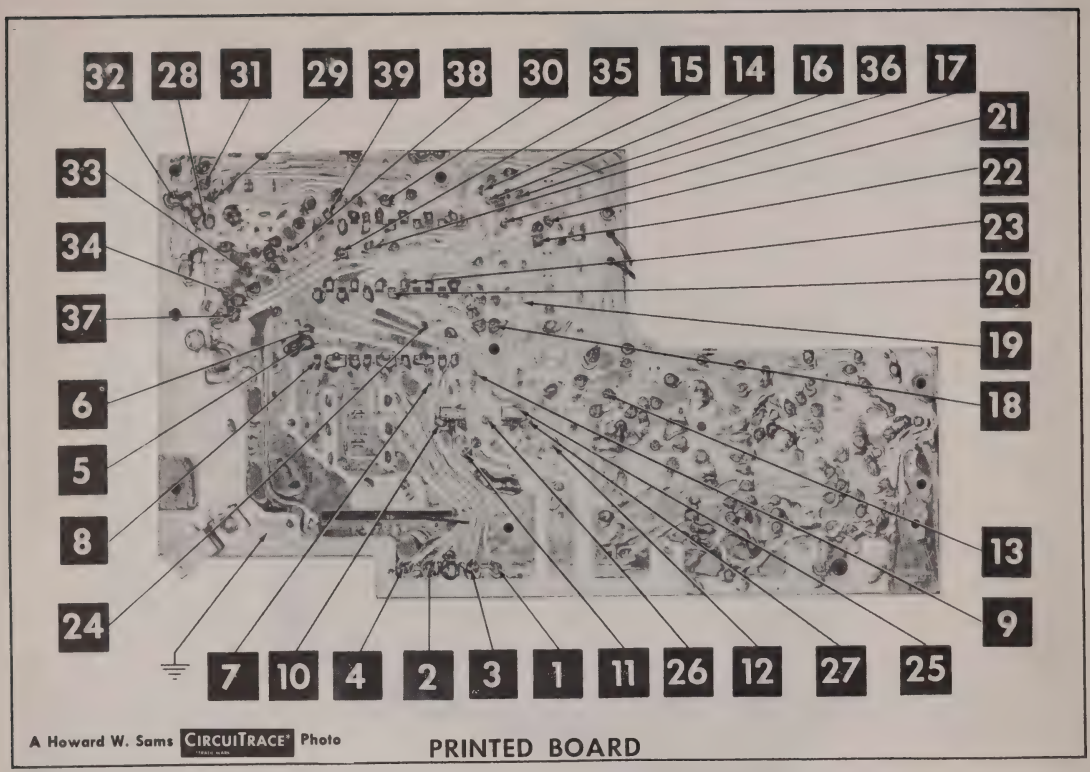

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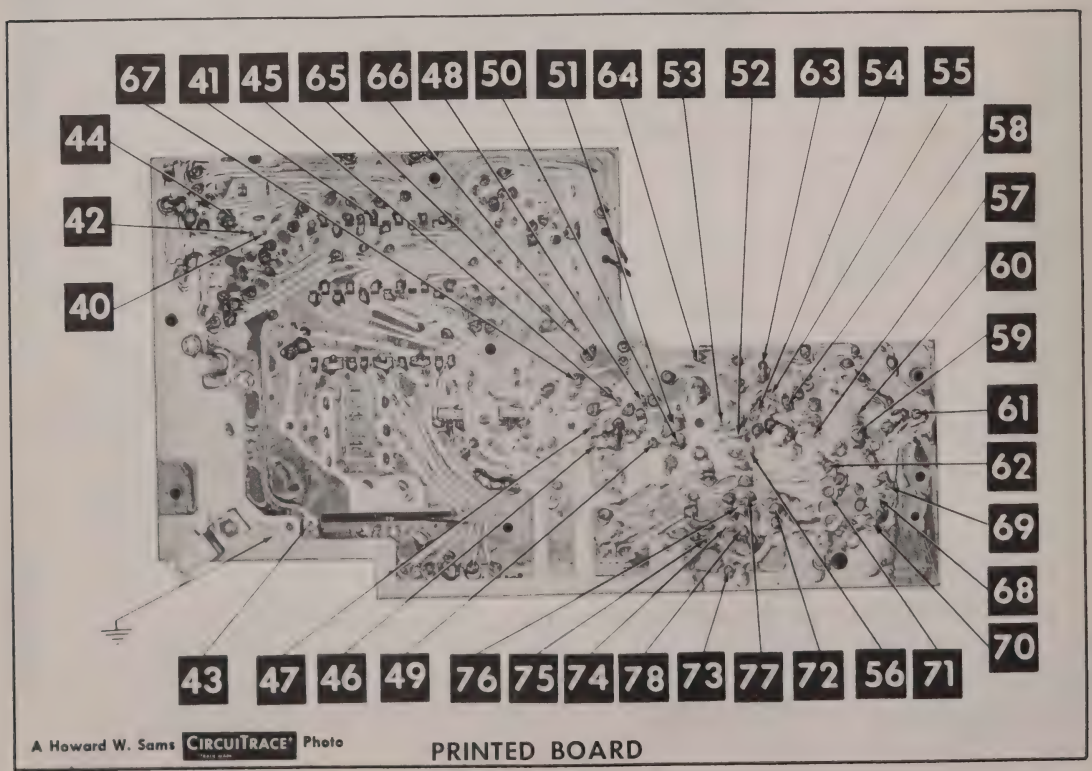
PRINTED BOARD



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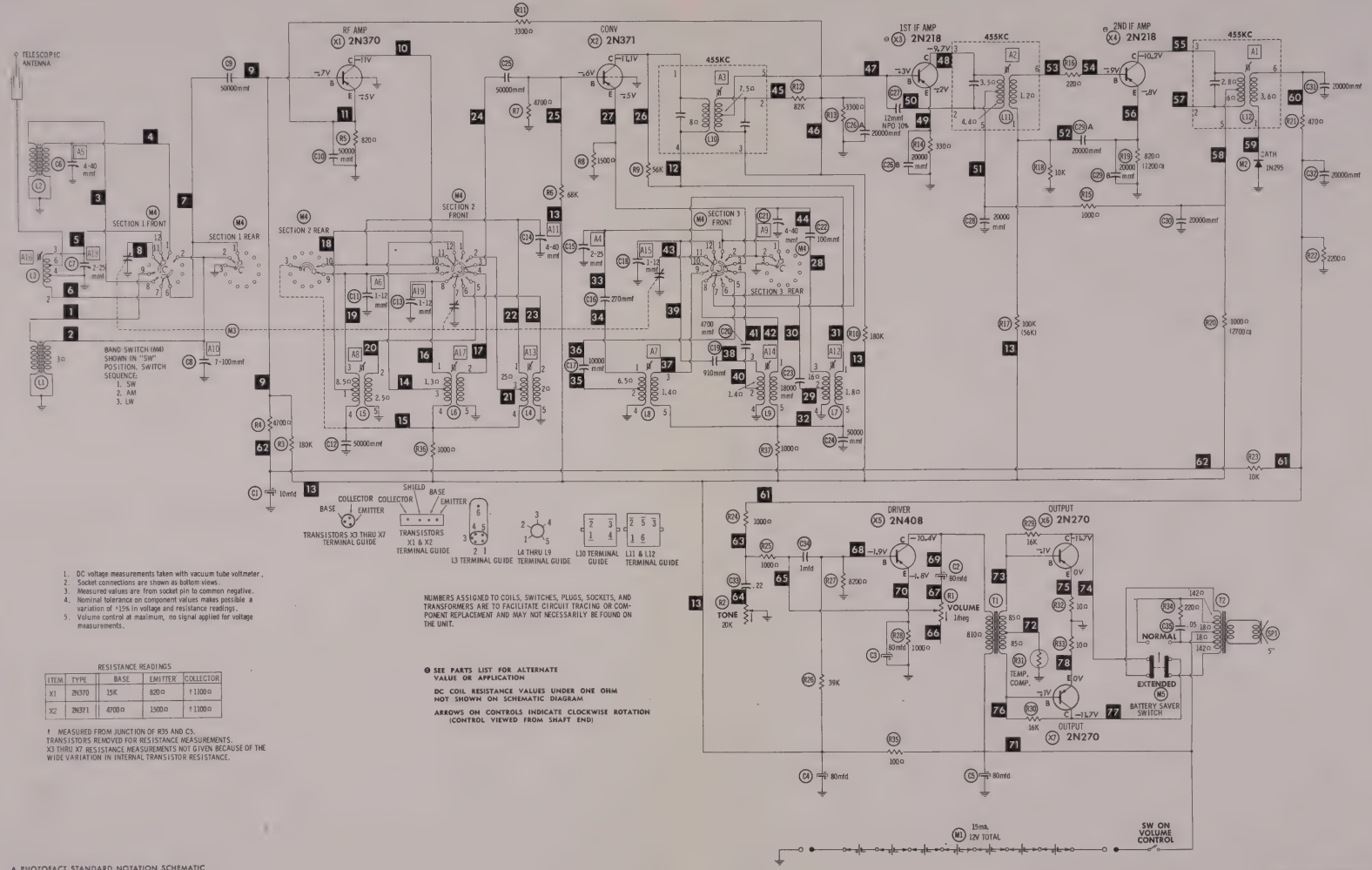

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

RESISTANCE READINGS

ITEM	TYPE	BASE	EMITTER	COLLECTOR
X1	2N370	15K	820Ω	†1100Ω
X2	2N371	4700Ω	1500Ω	†1100Ω

† MEASURED FROM JUNCTION OF R35 AND C5.
TRANSISTORS REMOVED FOR RESISTANCE MEASUREMENTS.
X3 THRU X7 RESISTANCE MEASUREMENTS NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE®
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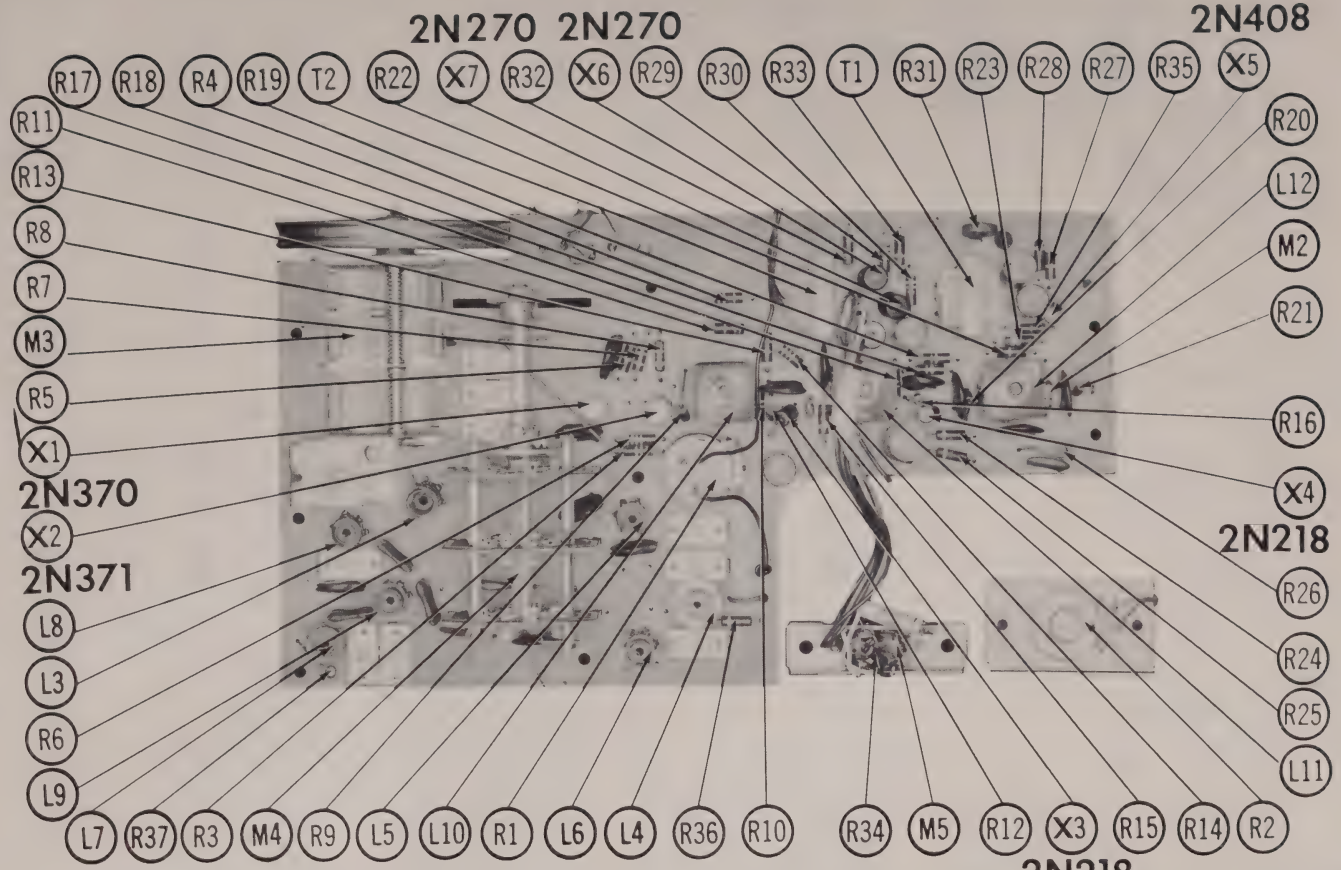
ARVIN MODEL 9598 (Ch. 1.47700)



CHASSIS TOP VIEW - RESISTOR, INDUCTOR, MISC. & TRANSISTOR IDENT.

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools:

A1 thru A6, A9, A10, A11, A15, A18, A19 .... GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8729, 8987, 8988, 8989
WALSCO #2515, 2531, 2532

A7, A8, A12, A13, A14, A16, A17 ..... GENERAL CEMENT #8282, 8606, 8606-L, 9295, 9440
WALSCO #2526, 2543, 2544, 2545

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	High side thru .05mfd to antenna stator lug of tuning gang. Low side to chassis.	455KC (400~ Mod.)	(BC) Tuning gang fully open	Across voice coil	A1, A2, A3	Adjust for maximum output.
2.	"	1670KC	"	"	A4	"
3.	Loop	1400KC	Tune to 1400KC signal	"	A5, A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
4.	"	600KC	Tune to 600KC signal	"	A7, A8	"
5.	High side thru .05mfd to antenna stator lug of tuning gang. Low side to chassis.	425KC	(LW) 425KC	"	A9	Adjust for maximum output.
6.	Loop	400KC	Tune to 400KC signal	"	A10, A11	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
7.	"	200KC	Tune to 200KC signal	"	A12, A13	Adjust for maximum output while rocking tuning gang.
8.	High side thru .05mfd to antenna stator lug of tuning gang. Low side to chassis.	2.1MC	(SW) 2.1MC	"	A14	Adjust for maximum output.
9.	"	6.3MC	Tune to 6.3MC signal	"	A15	"
10.	High side thru 15mmf to whip antenna connection. Low side to chassis.	2.5MC	Tune to 2.5MC signal	"	A16, A17	Adjust for maximum output while rocking tuning gang.
11.	"	5.5MC	Tune to 5.5MC signal	"	A18, A19	"

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA				NOTES
			CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2N370	RF Amplifier		2N370		2N370	PNP
X2	2N371	Converter		2N371		2N371	PNP
X3	2N218 *	1st IF Amplifier		2N218	2N483		PNP
X4	2N218 *	2nd IF Amplifier		2N218	2N483		PNP
X5	2N408	Driver		2N408	2N362	2N408	PNP
X6	2N270	Output		2N270	2N632	2N270	PNP } Matched
X7	2N270	Output		2N270	2N632	2N270	PNP } Pair

* Alternate Type 2N410.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	ARVIN PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1	10	12	47668-1	BCD12010	ECPA308	PET1760	ML10-15	VL-1127	
C2	80	12	47668-2	BCD12075	ECPA316	PET1500	ML100-15	VL-1137	
C3	80	12	47668-2	BCD12075	ECPA316	PET1500	ML100-15	VL-1137	
C4	80	12	47668-2	BCD12075	ECPA316	PET1500	ML100-15	VL-1137	
C5	80	12	47668-2	BCD12075	ECPA316	PET1500	ML100-15	VL-1137	

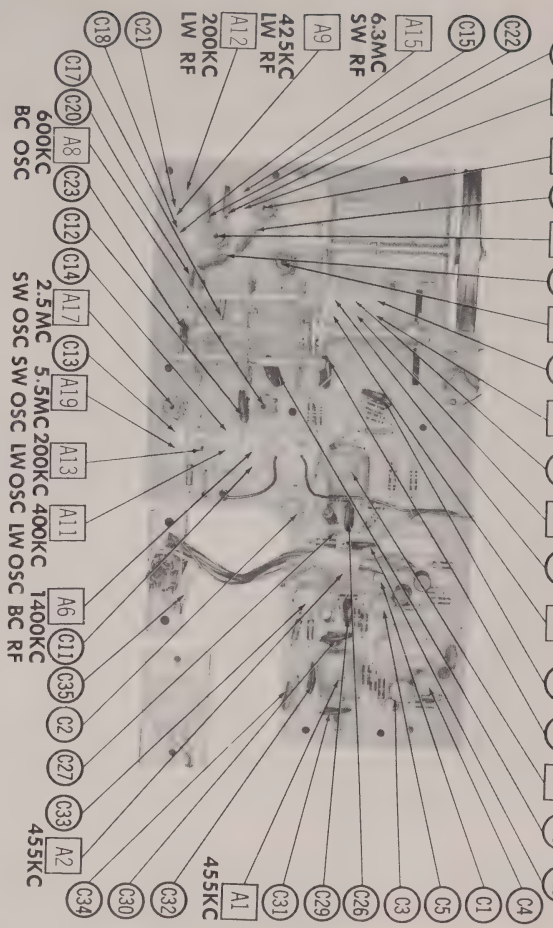
FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C6	4-40	#47392-3				422		
C7	2-25	#47392-2				421		
C8	7-100	#47392-4				423		
C9	50000		BPD-05	DD-503	H-05S5	1DP-2-503	GP150	5HK-S50
C10	50000		BPD-05	DD-503	H-05S5	1DP-2-503	GP150	5HK-S50
C11	1-12	#47392-1				420		
C12	50000		BPD-05	DD-503	H-05S5	1DP-2-503	GP150	5HK-S50
C13	1-12	#47392-1				420		
C14	4-40	#47392-3				422		
C15	2-25	#47392-2				421		
C16	270		1468-00027	DD-271	5W5R27	CM-19B-271M		MS-327
C17	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C18	1-12	#47392-1				420		
C19	910		1468-00091	DD-911	5W5T91	CM-19B-911M		MS-391
C20	4700		BPD-0047	DD-472	BYA10D47M	CCD-472	GP247	5HK-D47
C21	4-40	#47392-3				422		
C22	100		1468-0001	DD-101	5W5T1	DM-19B-101M	MC235	MS-310
C23	18000		BPD-02	DD-203	BYB6S2	CCD-203	GP120	5HK-S20
C24	50000		BPD-05	DD-503	H-05S5	1DP-2-503	GP150	5HK-S50
C25	50000		BPD-05	DD-503	H-05S5	1DP-2-503	GP150	5HK-S50
C26A	20000		BPD-2X02	DD-203	BYB6S2	CCD-203	GP120	5HK-2S20
B	20000			DD-203	BYA6S2	CCD-203	GP120	
C27	12 NPO 10%			TCZ-12	C10Q12C	CCTO-120	CNO-412	10TCC-Q12
C28	20000		BPD-02	DD-203	BYB6S2	CCD-203	GP120	5HK-S20
C29A	20000		BPD-2X02	DD-203	BYB6S2	CCD-203	GP120	5HK-2S20
B	20000			DD-203	BYB6S2	CCD-203	GP120	
C30	20000		BPD-02	DD-203	BYB6S2	CCD-203	GP120	5HK-S20
C31	20000		BPD-02	DD-203	BYB6S2	CCD-203	GP120	5HK-S20
C32	20000		BPD-02	DD-203	BYB6S2	CCD-203	GP120	5HK-S20
C33	.22 100V		P215IN-22			1DP-3-224		
C34	lmfd			UK-105				HYI35
C35	.05 100V		P288N-05	DD-503	CUB2S5	1DP-2-503	GEM-415	2TM-S5

Arvin Part Number

CHASSIS—TOP VIEW


BC OSC 1670KC
BC RF 600KC
SW RF 2.1MC
SW ANT 2.5MC
SW ANT 5.5MC
BC ANT 1400KC
LW ANT 400KC
455KC
6.3MC SW RF
425KC LW RF
200KC LW RF
600KC BC OSC
2.5MC SW OSC
5.5MC SW OSC
200KC LW OSC
400KC LW OSC
1400KC BC RF
455KC
C24 A4 C18 C21 A15 C15 C22
C17 C20 A8 C23 A7 C16 A14 A12 A9 C19 A16 C7 A18 C6 A5 C8 A10 C10 C9 A3 C25 C28
C12 C14 A17 C13 A19 A13 A11 A6 C11 C35 C2 C27 C33 A2
C34 C30 C32 A1 C31 C29 C26 C3 C5 C1 C4

PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA ARVIN PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A B R2	1meg Switch 20K	½ ½	45250-19 47500-1				TA16A US-26	Volume Power Off-On Tone

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R3	180K	
R4	4700Ω	
R5	820Ω	
R6	68K	
R7	4700Ω	
R8	1500Ω	
R9	56K	
R10	180K	
R11	3300Ω	
R12	82K	
R13	3300Ω	
R14	330Ω	

ITEM No.	RATING	REMARKS
R15	1000Ω	
R16	220Ω	
R17	100K	(56K) *
R18	10K	
R19	820Ω	(1200Ω) *
R20	1000Ω	(2700Ω) *
R21	470Ω	
R22	2200Ω	
R23	10K	
R24	1000Ω	
R25	1000Ω	
R26	39K	

ITEM No.	RATING	REMARKS
R27	8200Ω	
R28	1000Ω	
R29	16K	
R30	16K	
R31	Temp. Comp.	#47793-1
R32	10Ω	
R33	10Ω	
R34	220Ω	
R35	100Ω	
R36	1000Ω	
R37	1000Ω	

* Alternate Value

\# Arvin Part Number

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA ARVIN PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	LW Loopstick	46861-2						
L2	BC Loopstick	46861-1	14-7002	14-7002	BC-418	705-A		
L3	SW Antenna Coil	47657-1						
L4	LW RF Coil	47654-1						
L5	BC RF Coil	47655-1						
L6	SW RF Coil	47656-1						
L7	LW Osc. Coil	45783-14						
L8	BC Osc. Coil	45783-13						
L9	SW Osc. Coil	47391-1						
L10	1st IF Trans.	47733-1						
L11	2nd IF Trans.	45900-14						
L12	3rd IF Trans.	45900-15						

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO PRI.	TURNS RATIO SEC.	REPLACEMENT DATA ARVIN PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	.8	1	45604-5						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA ARVIN PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	250Ω CT	3-4Ω	H7658							

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA ARVIN PART No.	REPLACEMENT DATA QUAM PART No.	NOTES
SP1	5"	PM	3-4Ω	45599-6	5A1	

BATTERIES

ITEM No.	VOLTAGE	ARVIN PART No.	REPLACEMENT DATA BURGESS "A"	BURGESS "B"	EVEREADY "A"	EVEREADY "B"	MALLORY "A"	MALLORY "B"	NOTES
M1	1.5V	*		230 *		A100 *		M-13R *	* 8 Required

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA ARVIN PART No.	CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	NOTES
M2	1N295		1N295	1N295	1N295	Detector (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	ARVIN PART No.	NOTES
M3	Tuning Cap.	47298	3 Gang (Ant. 10-354mmf, RF 10-245mmf, Osc. 10-218mmf)
M4	Switch	47291	Function
M5	Switch	47305	Battery Saver (DPDT Slide Type)
	Antenna	47303	Short Wave

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	47294-29	Tuning, Volume
Knob	47293-70	Function Switch
Pointer	47387-1	
Dial Crystal	47297	
Cabinet Assembly	47650-19	

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

PHOTOFACT® Folder

AUTOMATIC MODELS D-2, D-8, DP-6, DP-11, H-4, H-9, HP-10, HP-15, W-76, WP-4, WP-7, WP-7G, WPC-8

AUTOMATIC MODELS D-2, D-8, DP-6, DP-11, H-4, H-9, HP-10, HP-15, W-76, WP-4, WP-7, WP-7G, WPC-8

MODEL VP-12

AUTOMATIC MODELS D-2, D-8, DP-6, DP-11, H-4, H-9, HP-10, HP-15, W-76, WP-4, WP-7, WP-7G, WPC-8

TRADE NAME	Automatic Models	Automobile
	D-2, DP-11	For 1959 Renault Dauphine (12 Volt)
	D-8, DP-6	For 1957, 1958, 1959 Renault Dauphine (6 Volt)
	H-4, HP-15	For 1959 Hillman Minx (12 Volt)
	H-9, HP-10	For 1958 Hillman (12 Volt)
	VP-12	Universal Type (12 Volt)
	W-76, WP-7, WPC-8	For Volkswagen (thru 1957) (6 Volt)
	WP-4	For 1958, 1959 Volkswagen (6 Volt)
	WP-7G	For Harmann GHIA (6 Volt)
MANUFACTURER	Automatic Radio Mfg. Co., Inc., 122 Brookline Ave., Boston 15, Mass.	
TYPE SET	Battery Operated 6 Tube Automobile AM Receiver	
POWER SUPPLY	12 Volt Storage Battery (or) 6 Volt Storage Battery	RATING 3.3 Amp. @12.6 Volts DC (or) 6.6 Amp. @6.3 Volts DC
TUNING RANGE—BROADCAST	538 – 1610KC	

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

* Pushbutton versions use 265KC; Manual tuning versions use 455KC.

Suggested alignment tools: A1 thru A4..... GENERAL CEMENT #8282, 8606, 8606-L, 9295, 9440
WALSCO #2526, 2543, 2544, 2545
A5, A6, A7..... GENERAL CEMENT #5000, 5003, 5066, 8276, 8290, 9087, 9089
WALSCO #2512, 2525, 2528

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	High side thru .1mfd to pin 7 (grid) of Converter. Low side to chassis.	* See Note	High end stop.	Across Voice coil.	A1, A2, A3, A4	Adjust for maximum output.
2.	"	1610KC	"	"	A5	"
3.	High side thru 68mmf to antenna receptacle. Low side to chassis.	"	"	"	A6, A7	"
4.	With radio installed in car and antenna fully extended, tune in a weak station near 1400KC and adjust A7 for maximum output.					

PUSHBUTTON ADJUSTMENT

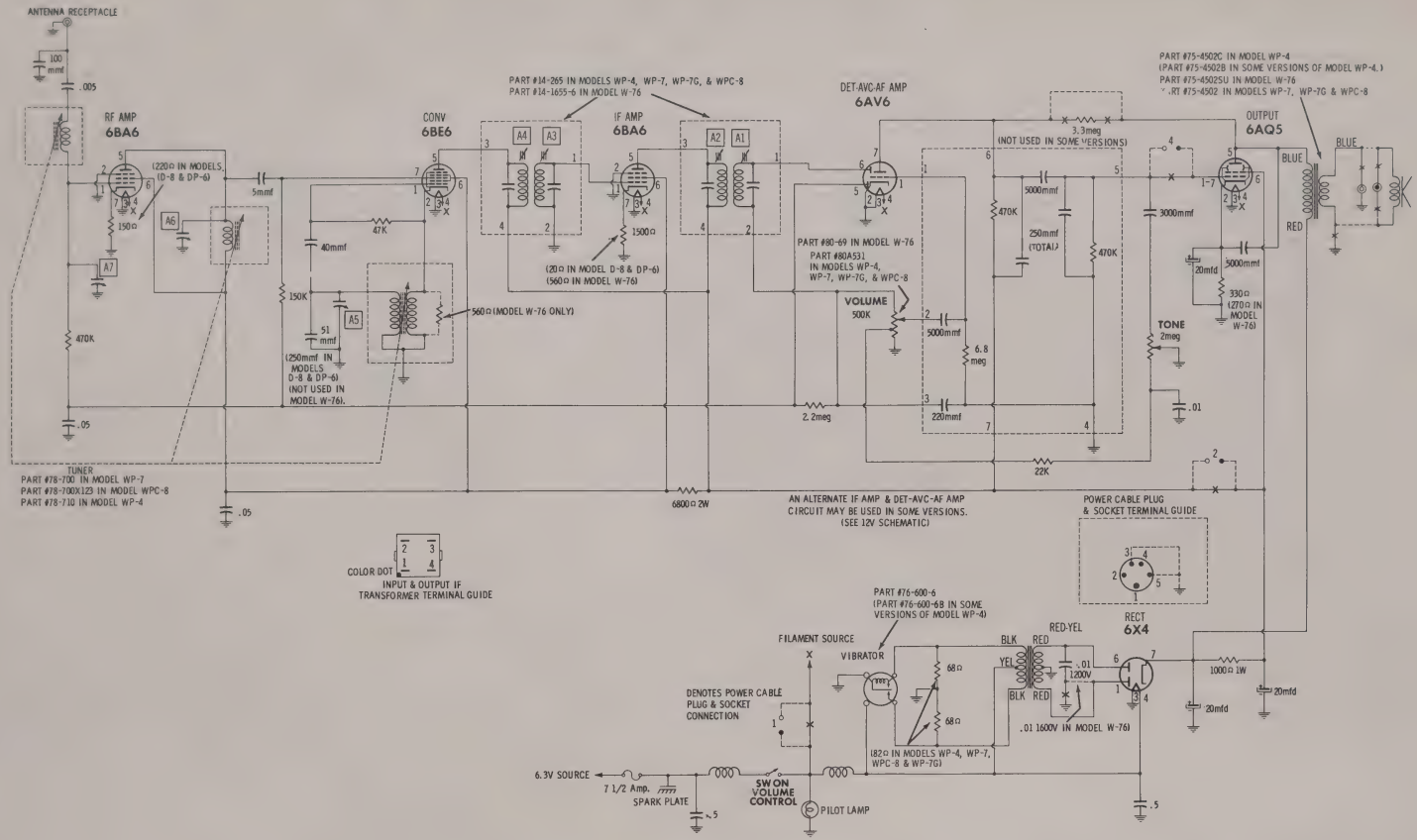
1. Pull button straight out.
2. Tune manually to desired station.
3. Press button in firmly.
4. Repeat for remaining button.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1960 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

JD699

SET 485 FOLDER 5



SCHEMATIC FOR 6V MODELS D-8, DP-6, W-76, WP-4, WP-7, WP-7G, & WPC-8

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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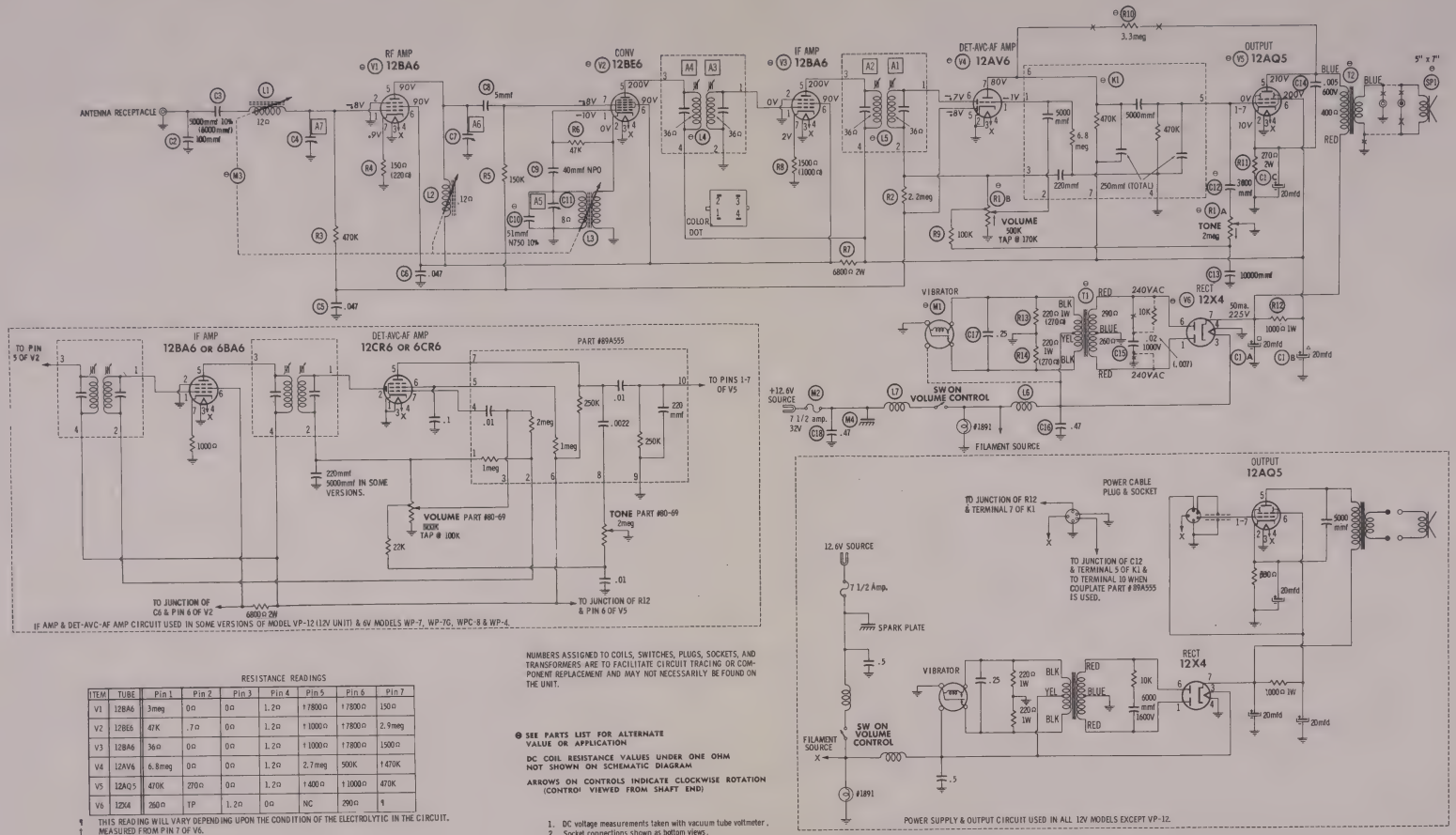
RF AMP
V1 12BA6
CONV
V2 12BE6
IF AMP
V3 12BA6
DET-AVC-AF AMP
V4 12AV6
OUTPUT
V5 12AQ5
ANTENNA RECEPTACLE
COLOR DOT
VOLUME 500K TAP @ 170K
TONE 2meg
VIBRATOR
RECT 12X4
240VAC
SW ON VOLUME CONTROL
+12.6V SOURCE
7 1/2 amp. 32V
FILAMENT SOURCE
5" x 7"
IF AMP
12BA6 OR 6BA6
DET-AVC-AF AMP
12CR6 OR 6CR6
PART #89A555
TO PIN 5 OF V2
TO PINS 1-7 OF V5
220mmf 5000mmf IN SOME VERSIONS.
VOLUME PART #80-69 500K TAP @ 100K
TONE PART #80-69 2meg
TO JUNCTION OF C6 & PIN 6 OF V2
TO JUNCTION OF R12 & PIN 6 OF V5
IF AMP & DET-AVC-AF AMP CIRCUIT USED IN SOME VERSIONS OF MODEL VP-12 (12V UNIT) & 6V MODELS WP-7, WP-7G, WPC-8 & WP-4.
POWER CABLE PLUG & SOCKET
TO JUNCTION OF R12 & TERMINAL 7 OF K1
TO JUNCTION OF C12 & TERMINAL 5 OF K1 & TO TERMINAL 10 WHEN COUPLATE PART #89A555 IS USED.
12.6V SOURCE
7 1/2 Amp.
SPARK PLATE
POWER SUPPLY & OUTPUT CIRCUIT USED IN ALL 12V MODELS EXCEPT VP-12.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12BA6	3meg	0Ω	0Ω	1.2Ω	†7800Ω	†7800Ω	150Ω
V2	12BE6	47K	.7Ω	0Ω	1.2Ω	†1000Ω	†7800Ω	2.9meg
V3	12BA6	36Ω	0Ω	0Ω	1.2Ω	†1000Ω	†7800Ω	1500Ω
V4	12AV6	6.8meg	0Ω	0Ω	1.2Ω	2.7meg	500K	†470K
V5	12AQ5	470K	270Ω	0Ω	1.2Ω	†400Ω	†1000Ω	470K
V6	12X4	260Ω	TP	1.2Ω	0Ω	NC	290Ω	¶

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 7 OF V6.

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Battery voltage maintained at 12.6 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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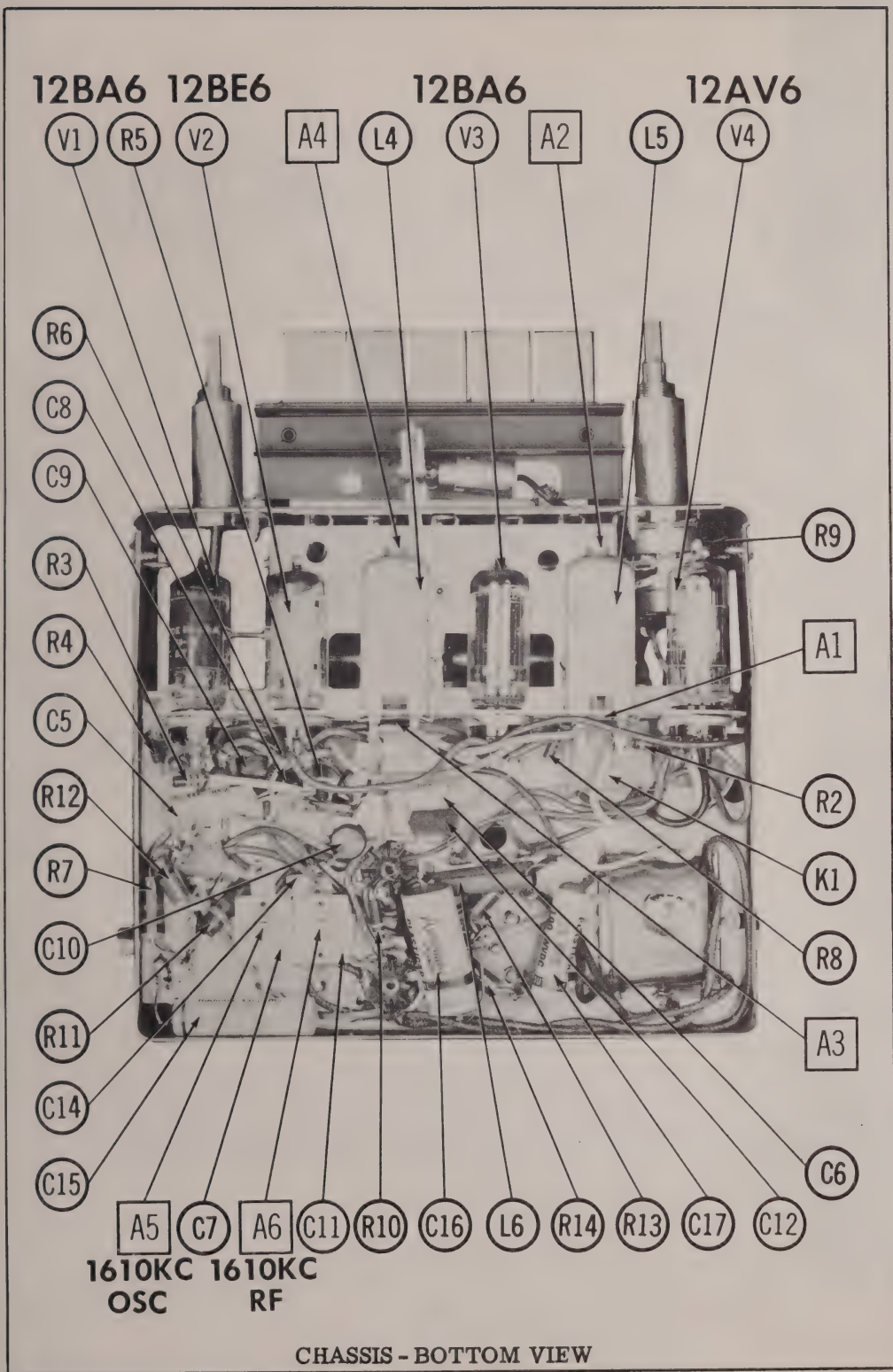


CHASSIS - BOTTOM VIEW

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	RF Amplifier	12BA6 ①	V4	Det. -AVC-AF Amp.	12AV6 ①②
V2	Converter	12BE6 ①	V5	Output	12AQ5 ①
V3	IF Amplifier	12BA6 ①	V6	Rectifier	12X4 ①

(CBS • GENERAL ELECTRIC • RAYTHEON • SYLVANIA)

① Models WP-4, DP-6 & D-8 use equivalent 6.3V tubes.
② Some 12 volt versions may use 12CR6 in this application.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA AUTOMATIC PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	■20	350	20-86S	AFH3-107	CO800	FP329.5	TMT-92	TVL-3635	
B	▲20	350							
C	20	25							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	100		1468-0001	DD-101	5W5T1	CM-19B-101M	MC235	1FM-310
C3	5000 10%	(6000) †	DI-5000		PM6D5	CCD-502	JL-250	10TS-D50
C4								
C5	.047 200V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C6	.047 200V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C7								
C8	5		NPO-DI 5.0	DTZ-4R7	C10V5C	CCTO-050	CNO-547	10TCC-V50
C9	40 NPO		NPO-DI 39	TCZ-39	C10Q39C	CCTO-390	CNO-439	10TCC-Q39
C10	51 N750 10%			TCN-51	C10Q51U			10TCU-Q51
C11		②						
C12	3000		BPD-003	DD-302	BYA10D3	CCD-302	GP230	5HK-D30
C13	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C14	.005 600V		P688N-005	D6-502	CUB6D5	6DP-1-502	GEM-625	6TM-D5
C15	.02 1000V	(.007) †	P1088N-02		CUBi0S2	16DP-4-203	GEM-1012	10TM-S2
C16	.47 100V		P288N-47		CUB2P47	2DP-5-474	GEM-2047	2TM-P47
C17	.25 100V		P288N-25		CUB2P25	2DP-4-254	GEM-2025	2TM-P25
C18	.47 100V		P288N-47		CUB2P47	2DP-5-474	GEM-2047	2TM-P47

† Alternate Value.
① Models D-2, DP-11, H-4, H-9, HP-10, HP-15, use 250mmf in this application.
② When C12 is part of C-R unit, value is 2200mmf.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA AUTOMATIC PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	2meg		80A531					Tone, Note 1
B	500K							Volume, Note 1
	170K Tap							
C	Switch							Power Off-On
R1A	2meg		80-69	F1-68	RTV-553C			Tone, Note 2
B	500K			R2-45	Not Req.			Volume, Note 2
	100K Tap					QJ-892A	■ UE4018S	
C	Bushing			AK-26	XB-2			
D	Switch			KR-4	Not Req.			Power Off-On

Note 1. Used in Models WP-4, WP-7, WPC-8, WP-7G, VP-12.
Note 2. Used in Models D-2, D-8, DP-6, H-4, H-9, HP-10, HP-15, W-76.
■ "STA-LOC" equivalent: FL26A, RU55T184, OS1812A, IS2312, US41.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R2	2.2meg	
R3	470K	
R4	150Ω	(220Ω) *
R5	150K	
R6	47K	

ITEM No.	RATING	REMARKS
R7	6800Ω 2W	
R8	1500Ω	(1000Ω) *
R9	100K	
R10	3.3meg	①
R11	270Ω 2W	

ITEM No.	RATING	REMARKS
R12	1000Ω 1W	
R13	220Ω 1W	(270Ω) *
R14	220Ω 1W	(270Ω) *

* Alternate Value.
① Not used in some versions.

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	AUTOMATIC PART No.	REPLACEMENT DATA
K1	Audio Coupling	220mmf, 250mmf 5000mmf, 5000mmf, 470K, 470K, 6.8meg	①	Aerovox PA-113-2 Centralab PC-151 Cornell-Dubilier 116TM2 Mallory MS-107 Sprague DT-2

① Part #89A555 used in some versions.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA AUTOMATIC PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	Ant. Coil							
L2	RF Coil							
L3	Osc. Coil							
L4	Input IF Trans.	14-265 ①	16-6752	16-6752	BC-350	12-H1	RF-3	
L5	Output IF Trans.	14-265 ①	16-6752	16-6752	BC-350	12-H1	RF-3	
L6	Hash Choke	14-205						10uh
L7	"A" Hash Choke							

① Part #14-1655-6 used in Model W-7G.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA AUTOMATIC PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	12V ⓐ 1.9A	480 VCT ⓐ .050A		76-600-12B ① 76-600-6B ②	22R63				22R63	

① Alternate Part #76-600-12. Used in 12 volt versions.
② Alternate Part #76-600-6. Used in 6 volt versions.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA AUTOMATIC PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	5200Ω	3-4Ω	75-4502B ①	24S51	A-2930	AU-601	A-3850	24S51	S-3X	

① Alternate Part #75-4502.
Part #75-4502 used in Model WP-4.
Part #75-4502SU used in Model W-76.

PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	AUTOMATIC PART No.	QUAM PART No.	
SP1	5"x 7"	PM	3-4Ω	73-655	57A21	* Alternate
	6"x 9"	PM	3-4Ω	73-902 *		
	5"	PM	3-4Ω	73-272 *	5A15	

VIBRATOR

ITEM No.	TYPE	INPUT VOLTS	FREQUENCY	REPLACEMENT DATA				NOTES
				AUTOMATIC PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	RADIART PART No.	
M1	Interruptor	12	115v	113-55 *	6330	G-883	6330	* 12 volt versions
	Interruptor	6	115v	113-83 †	5715	M-1501	5715	† 6 volt versions

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			AUTOMATIC PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	SFE	7½A 32V	108-100		307007.5	155009	SFE 7½	HHH

MISCELLANEOUS

ITEM No.	PART NAME	AUTOMATIC PART No.	NOTES
M3	Tuner	78-710	Pushbutton, WP-4, & VP-12
	Tuner	78-712R	Model W-76
	Tuner	78-700	Model WP-7 , WP-7G
	Tuner	78-700X 123	Model WPC-8
	Tuner	78-7128	Model W-76
M4	Spark Plate	15-801 FT	

CABINETS & CABINET PARTS

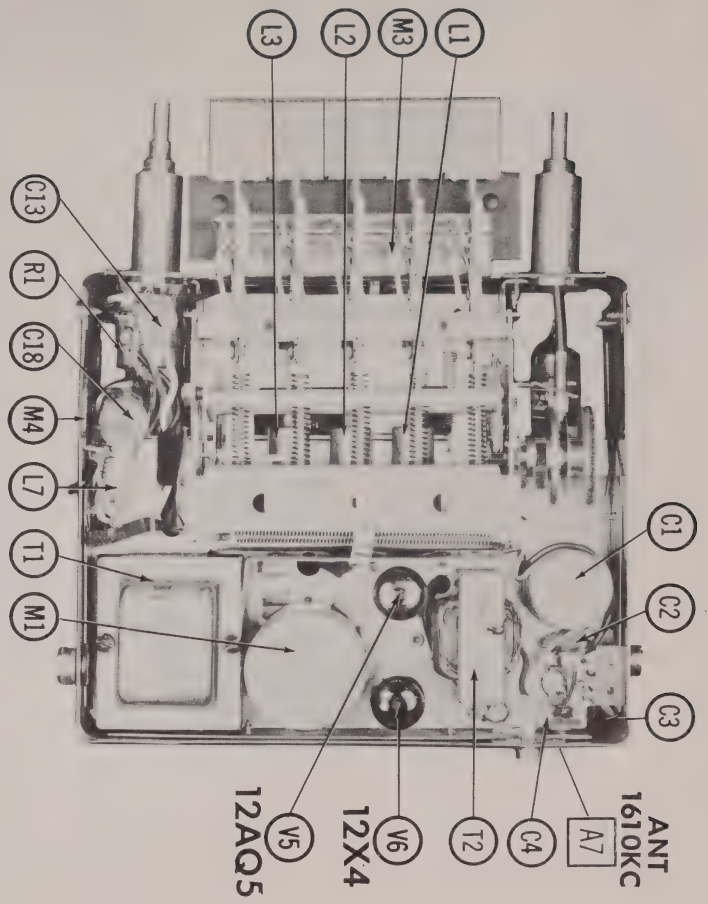
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	47B319-2W	Tuning, Volume
Knob	47B393	Tone
Knob	48B393	Models WPC-8, W-76
Knob	47B393-1	Dummy
Knob	48B393-1	Models WPC-8, W-76
Dial Scale	39A575	All Models Except W-76, WP-4
Dial Scale	39A575-1	Models W-76, WP-4

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Shielded Hook-up Wire	Use BELDEN No. 8885
Bonding Strap	Use BELDEN No. 8661

CHASSIS—TOP VIEW



FOLDER 5

AUTOMATIC MODELS D-2, D-8, DP-6, DP-11, H-4, H-9, HP-10, HP-15, W-76, WP-4, WP-7, WP-7G, WPC-8

PHOTOFACT® Folder with CIRCUITRACE®

CHANNEL MASTER
MODELS 6512, 6514

CHANNEL MASTER
MODELS 6512, 6514

MODEL 6512

TRADE NAME	Channel Master Models 6512, 6514		
IMPORTER	Channel Master Corp., Ellenville, N. Y.		
TYPE SET	Battery Operated Transistorized 2 Band Portable Receiver		
POWER SUPPLY	6 Volts DC	RATING	8MA@6 Volts DC (No Signal, Min. Volume) 17MA@6 Volts DC (Signal, Normal Volume)
TUNING RANGE—BROADCAST	530 – 1650KC	SHORT WAVE	3.8MC – 12.5MC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.
Suggested alignment tools: A6, A8, A10, A12... GENERAL CEMENT #5000, 5003, 5066, 8271, 8272, 8276, 8277, 8290, 8609, 8722, 9150, 9298
WALSCO #2515, 2516, 2518, 2519, 2525, 2541

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	High side thru .01mfd to base of Mixer. Low side to chassis.	455KC (400~ Mod.)	(BC) Tuning gang fully open.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
2.	Loop	530KC	Tuning gang fully closed.	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.	"	1650KC	Tuning gang fully open.	"	A6	Adjust for maximum output. Repeat Steps 2 and 3.
4.	"	600KC	600KC	"	A7	Adjust for maximum output.
5.	"	1400KC	1400KC	"	A8	"
6.	"	3.8MC	(SW) 3.8MC	"	A9	"
7.	"	12.5MC	12.5MC	"	A10	Adjust for maximum output. Repeat Steps 6 and 7.
8.	"	4.2MC	4.2MC	"	A11	Adjust for maximum output.
9.	"	12MC	12MC	"	A12	"

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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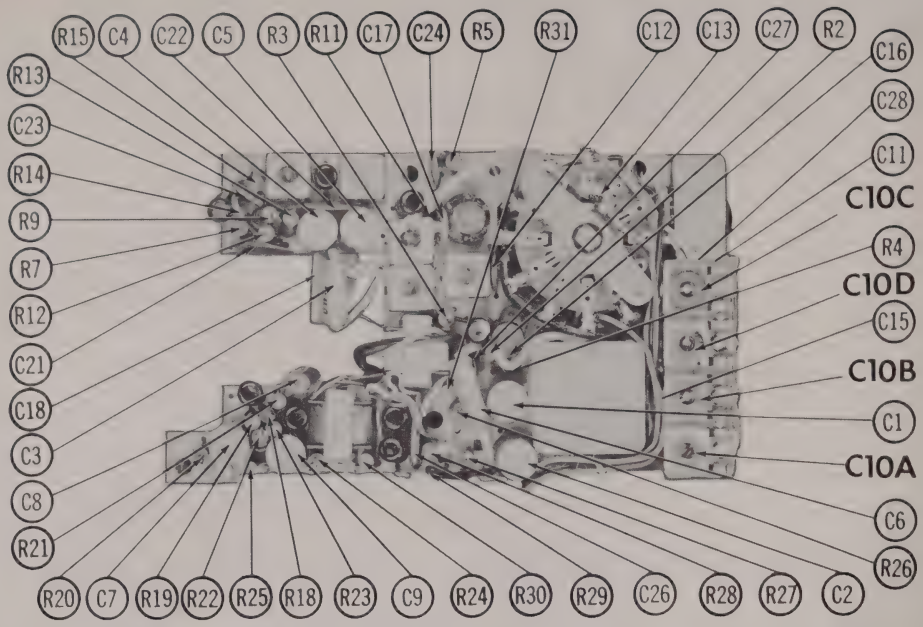
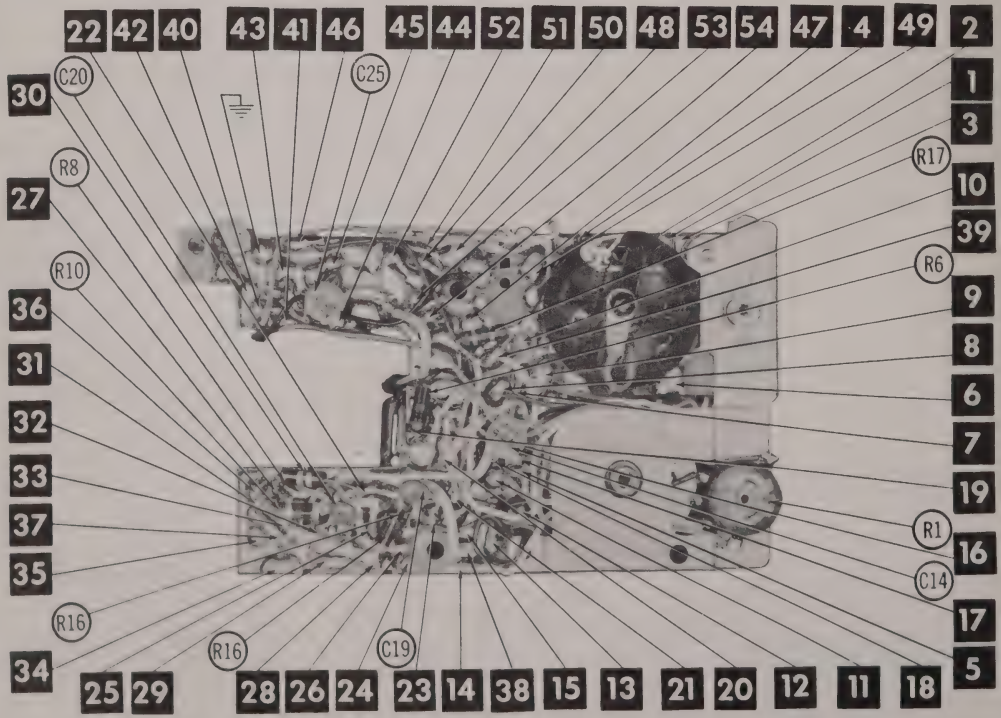
JF700

SET 485 FOLDER 6

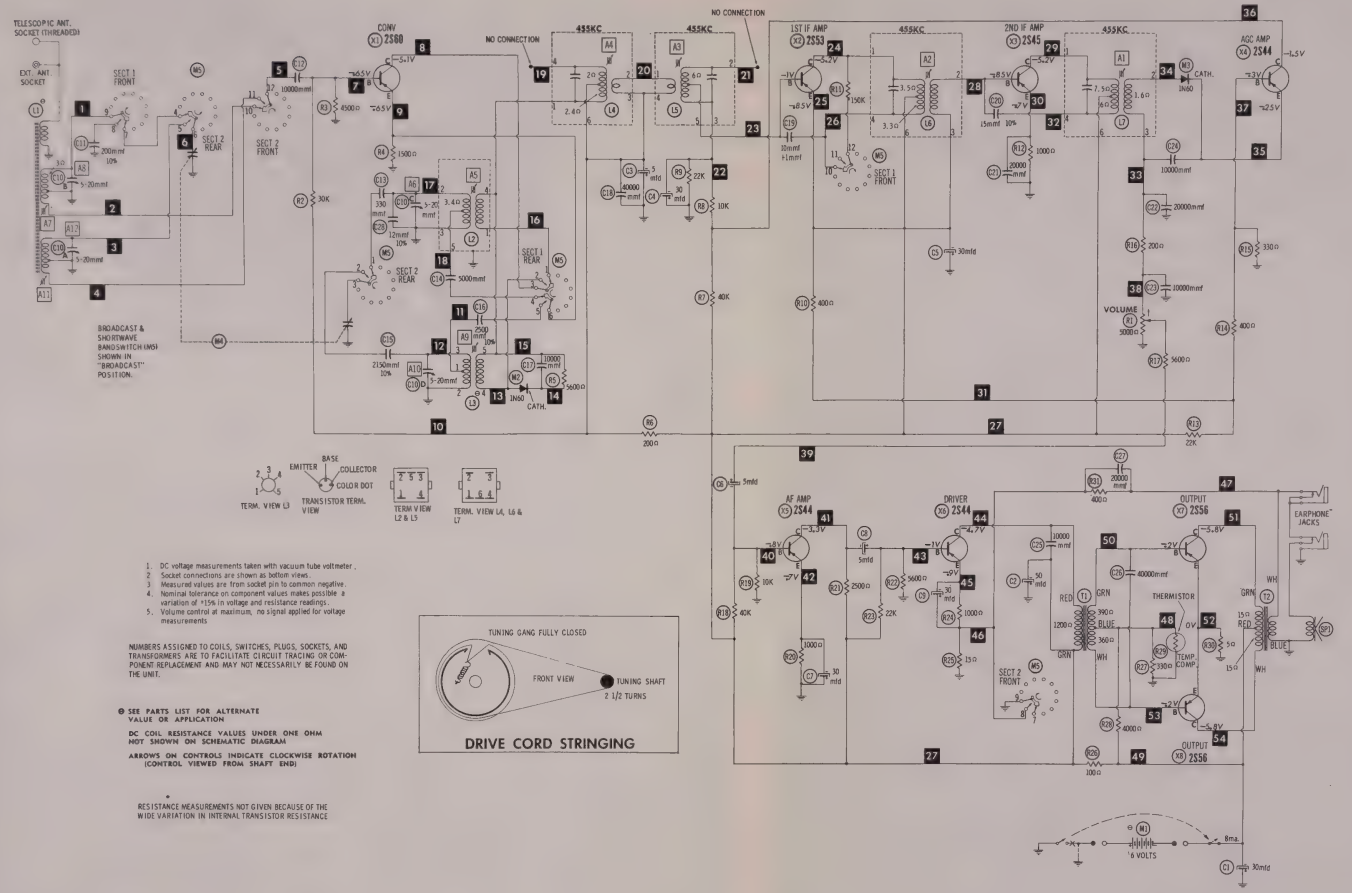


CHASSIS TOP VIEW-CAPACITOR AND RESISTOR IDENTIFICATION



A Howard W. Sams CIRCUITRACE Photo

PRINTED BOARD



1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

* RESISTANCE MEASUREMENTS NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE

DRIVE CORD STRINGING

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE

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CHANNEL MASTER MODELS 6512, 6514

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA				NOTES
			CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2S60	Converter					PNP
X2	2S53	1st IF Amplifier		2N410	2N483	2N410	PNP
X3	2S45	2nd IF Amplifier		2N410	2N483	2N410	PNP
X4	2S44	AGC Amplifier		2N406	2N362		PNP
X5	2S44	AF Amplifier		2N406	2N362		PNP
X6	2S44	Driver		2N406	2N362		PNP
X7	2S56	Output		2N408	2N632	2N408	PNP } Matched
X8	2S56	Output		2N408	2N632	2N408	PNP } Pair

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	Channel Master PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1	30	6	A009	BCD6030	ECPA112	TT6X30	ML30-6	TE-1132	
C2	50	6	A031	BCD6050	ECPA115	TT6X50		TE-1100	
C3	5	6	A010	XPP-6005	NLW5-6	TT6X5	ML5-6	TE-1084	
C4	30	6	A009	BCD6030	ECPA112	TT6X30	ML30-6	TE-1132	
C5	30	6	A009	BCD6030	ECPA112	TT6X30	ML30-6	TE-1132	
C6	5	6	A010	XPP-6005	NLW5-6	TT6X5	ML5-6	TE-1084	
C7	30	6	A009	BCD6030	ECPA112	TT6X30	ML30-6	TE-1132	
C8	5	6	A010	XPP-6005	NLW5-6	TT6X5	ML5-6	TE-1084	
C9	30	6	A009	BCD6030	ECPA112	TT6X30	ML30-6	TE-1132	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C10A	5-20	#A024						
B	5-20							
C	5-20							
D	5-20							
C11	200 10%			DI-201	L10T2	CCD-201	GP320	10TS-T20
C12	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C13	330		SI 330	DI-331	L10T33	CCD-331	GP330	10TS-T33
C14	5000		BPD-005	DD-502	BYA10D5	CCD-502	GP250	5HK-D50
C15	2150 10%		DI-2200			CCD-222	GP222	10TS-D22
C16	2500 10%	#A026				CCD-252		10TS-D25
C17	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C18	40000	#A015		DD-403				
C19	10 + 1mmf		NPO-DI 10	DTZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C20	15 10%		NPO-DI 15	DTZ-15	C10Q15C	CCTO-150	CNO-415	10TCC-Q15
C21	20000		BPD-02	DD-203	BYB6S2	CCD-203	TA-120	TG-S20
C22	20000		BPD-02	DD-203	BYB6S2	CCD-203	TA-120	TG-S20
C23	10000		BPD-01	DD-103	BYA10S1	CCD-103	TA-110	5HK-S10

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C24	10000	#A015	BPD-01	DD-103	BYA10S1	CCD-103	TA-110	5HK-S10
C25	10000		BPD-01	DD-103	BYA10S1	CCD-103	TA-110	5HK-S10
C26	40000			DD-403				
C27	20000		BPD-02	DD-203	BYB6S2	CCD-203	TA-120	TG-S20
C28	12 10%			TCZ-12	C10Q12C	CCTO-120	CNO-412	10TCC-Q12

Channel Master Part Number.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Channel Master PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1	5000Ω	1/4	E015					Volume & Switch

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R2	30K	
R3	4500Ω	
R4	1500Ω	
R5	5600Ω	
R6	200Ω	
R7	40K	
R8	10K	
R9	22K	
R10	400Ω	
R11	150K	

ITEM No.	RATING	REMARKS
R12	1000Ω	
R13	22K	
R14	400Ω	
R15	330Ω	
R16	200Ω	
R17	5600Ω	
R18	40K	
R19	10K	
R20	1000Ω	
R21	2500Ω	

ITEM No.	RATING	REMARKS
R22	5600Ω	
R23	22K	
R24	1000Ω	
R25	15Ω	
R26	100Ω	
R27	330Ω	
R28	4000Ω	
R29	Temp. Comp.	#F150
R30	5Ω	
R31	400Ω	

Channel Master Part Number.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		Channel Master PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Loopstick	E016①						
L2	BC Osc. Coil	F164						
L3	SW Osc. Coil	F163②						
L4	1st IF Pri. Trans.	C014						
L5	1st IF Sec. Trans.	C015						
L6	2nd IF Trans.	C016						
L7	3rd IF Trans.	C007						

① Part #E020 used in Model 6514.
② Part #F165 used in Model 6514.

PARTS LIST AND DESCRIPTIONS

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA						NOTES
	PRI.	SEC.	Channel Master PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	4	1	C017						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	Channel Master PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	200Ω	6-8Ω	C018							

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	Channel Master PART No.	QUAM PART No.	
SP1	2 5/8"	PM	8-10Ω	G 092	25A07	

BATTERIES

ITEM No.	VOLTAGE	Channel Master PART No.	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
			"A"	"B"	"A"	"B"	"A"	"B"	
M1	1.5 V			930 *		1015 *		M-15R *	* 4 Required

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		Channel Master PART No.	CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M2	1N60	F149	1N60	1N60	1N60	Overload (Pigtail)
M3	1N60	F149	1N60	1N60	1N60	Detector (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	Channel Master PART No.	NOTES
M4	Tuning Cap	A025	2 Gang
M5	Switch	E017	Band
M6	Antenna	E014	Telescoping Assembly
	Earphone	E002	

CABINETS & CABINET PARTS

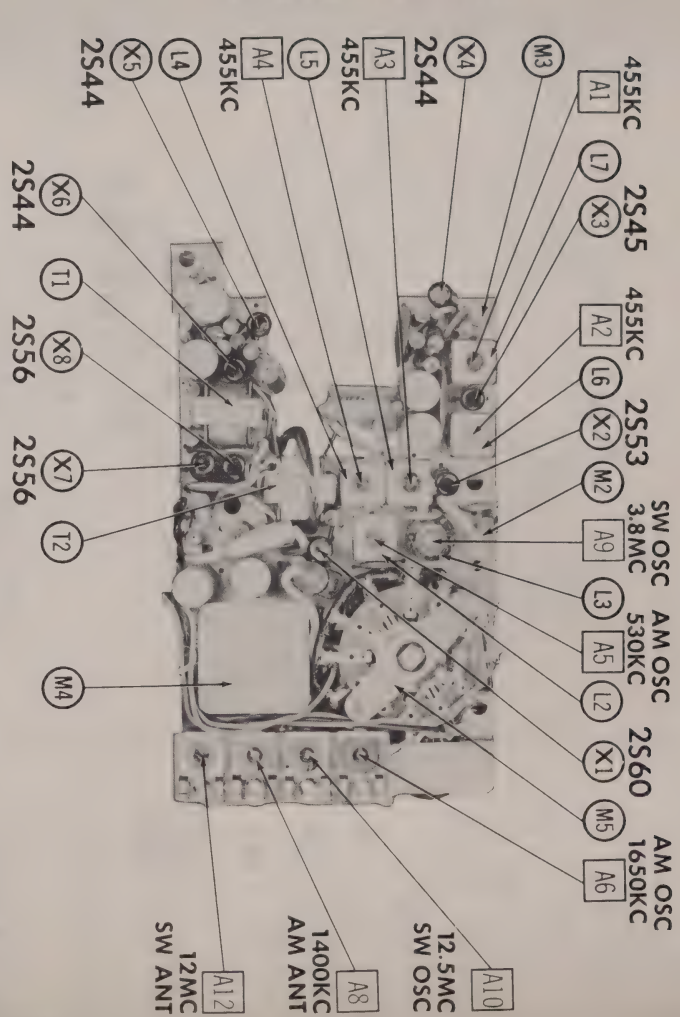
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	F015	Tuning, Volume
Knob	F014	Band Switch
Dial	F016	Model 6514
Cabinet	G009	Black, Model 6512
Cabinet	G010	Red, Model 6512
Cabinet	G011	Black, Model 6514
Cabinet	G012	Red, Model 6514

WIRING DATA

General-use Unshielded Hook-up Wire .....Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

CHASSIS—TOP VIEW



PHOTOFACT® Folder

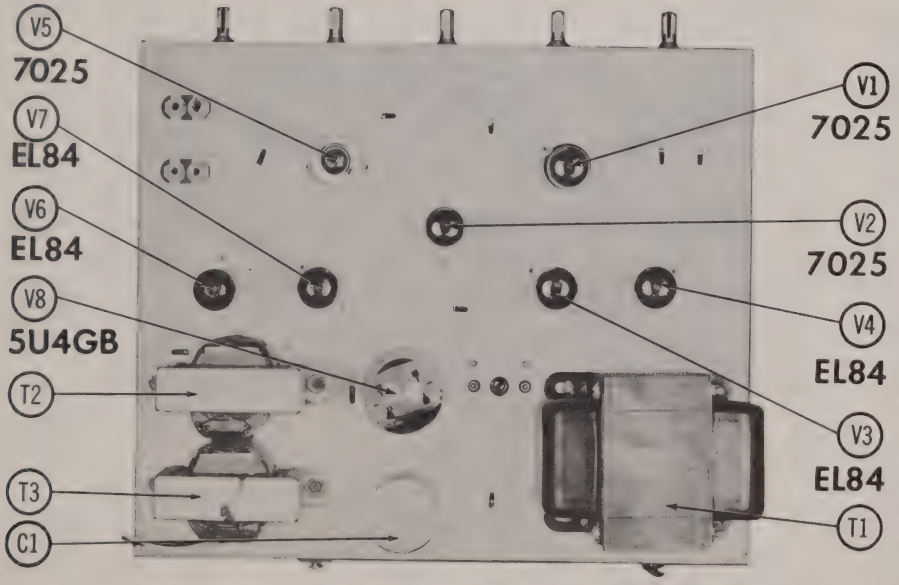
CURTIS MATHES MODELS 49MD, 59MD, 69MD, 149MD, 159MD, 169MD (Ch. 9)

CURTIS MATHES MODELS 49MD, 59MD, 69MD, 149MD, 159MD, 169MD (Ch. 9)

MODEL 149MD

TRADE NAME	Curtis Mathes Models 49MD, 59MD, 69MD, 149MD, 159MD, 169MD (Ch. 9)
MANUFACTURER	Curtis Mathes Mfg. Co., 2220 Young Street, Dallas, Texas
TYPE SET	AC Operated 8 Tube Stereo Phono Amplifier With 4 Speed Automatic Record Changer
POWER SUPPLY	110-120 Volts AC, 60 Cycles RATING 125 Watts, 1.2 Amp. @117 Volts AC (Less Motor)

FOR SERVICE INFORMATION ON RECORD CHANGER —SEE SIMILAR V-M 1201 —PHOTOFACT SET 436 FOLDER 18



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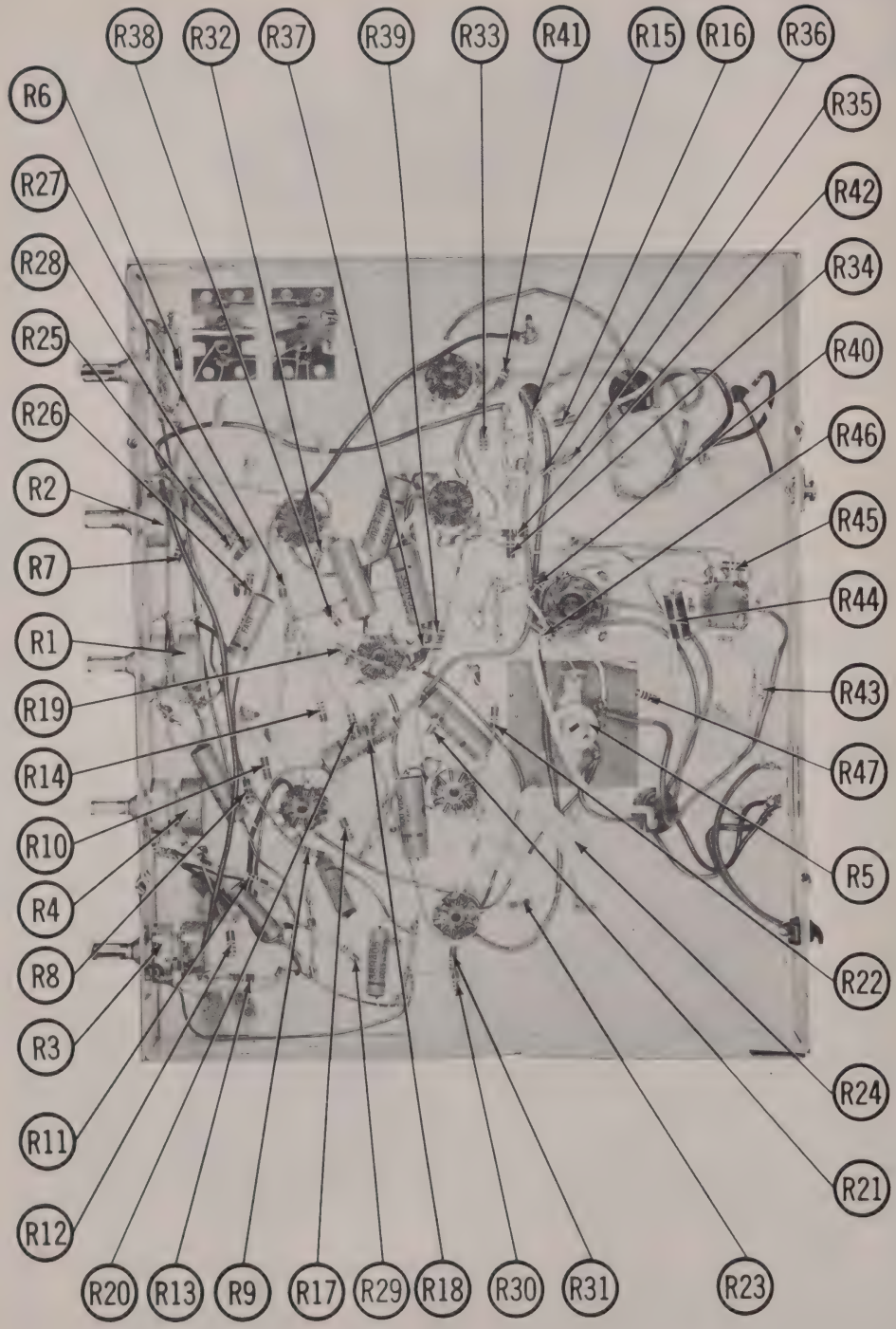
JT 713



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

PARTS LIST AND DESCRIPTIONS

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆

ITEM No.	USE	TYPE
V1	Channel 1 AF Amp.	7025 (12AX7) *
V2	Channel 1 Phase Inverter- Channel 2 Phase Inverter	7025 (12AX7) *
V3	Channel 1 Output	EL84/6BQ5
V4	Channel 1 Output	EL84/6BQ5
V5	Channel 2 AF Amp.	7025 (12AX7) *
V6	Channel 2 Output	EL84/6BQ5
V7	Channel 2 Output	EL84/6BQ5
V8	Rectifier	5U4GB

* Alternate

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	Curtis Mathes PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▲60	400		AFH4-123	DO477.5	FP454.5	TMQ-107	TVL-4811	
B	■40	400							
C	▲10	400							
D	100	25		PWE25100	BBR100-15	TT15X100	ML100-15	TE-1162	
C2	100	15		PRS7315	BBR20-150 †	TCN5010		TVANS-1204.1 *	
C3	10	25NP		PRS7315	BBR20-150 †	TCN5010		TVANS-1204.1 *	
C4	10	25NP							

† Use 2 units. Connect negative terminals together. Connect positive terminals into circuit the same as the original non-polarized unit.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

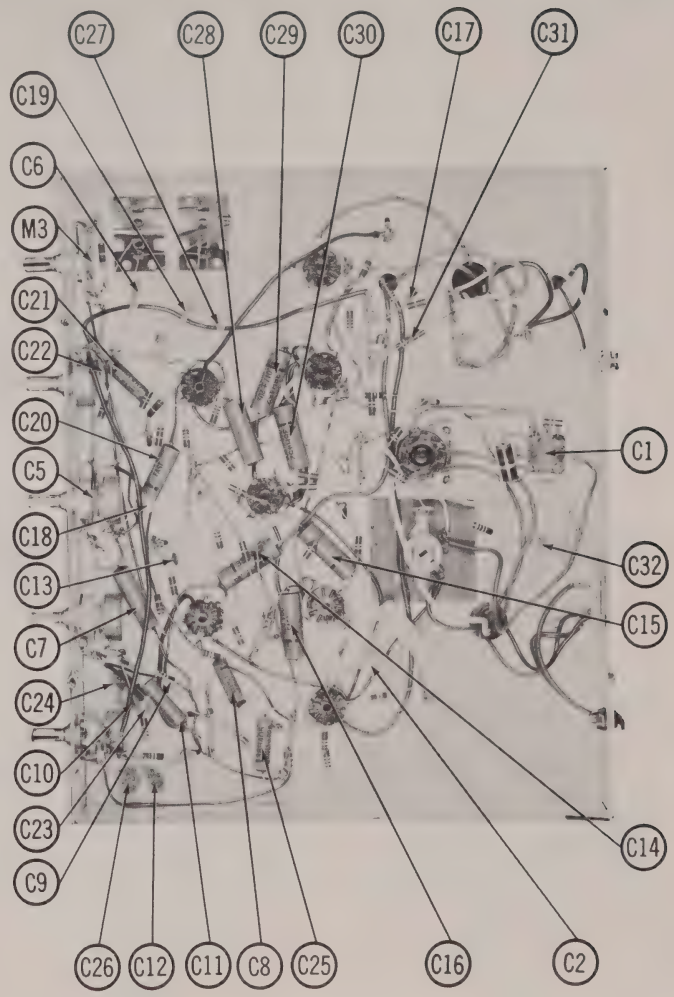
FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C5	47		DI-47	DD-470	L10Q47	CCD-470	GP447	10TS-Q47
C6	10000	(1500) †	BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C7	.047 200V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C8	.0047 400V		P488N-0047	D6-472	CUB6D47	6DP-1-472	GEM-6247	6TM-D47
C9	330		DI-330	DD-331	L10T33	CCD-331	GP333	10TS-T33
C10	4700		BPD-0047	DD-472	BYA10D47M	CCD-472	GP247	5HK-D47
C11	.0015 400V		P488N-0015	D6-152	CUB6D15	6DP-1-152	GEM-6215	6TM-D15
C12	4700		BPD-0047	DD-472	BYA10D47M	CCD-472	GP247	5HK-D47
C13	100	Note 1	BPD-0001	DD-101	L10T1	CCD-101	GP310	10TS-T10
C14	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C15	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C16	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C17	680		DI-680	DD-681	BYA10T68	CCD-681	GP368	10TS-T68
C18	47 N750 10%		DI-47	DTN-47	C10Q47U	CCTN-470	CN7-447	10TCU-Q47
C19	10000	(1500) †	BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C20	.047 200V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C21	.0047 400V		P488N-0047	D6-472	CUB6D47	6DP-1-472	GEM-6247	6TM-D47
C22	82 N750 10%	Note 1		TCN-82	C10Q82U	CCTN-820	CN7-482	10TCU-Q82
C23	330		DI-330	DD-331	L10T33	CCD-331	GP333	10TS-T33
C24	4700		BPD-0047	DD-472	BYA10D47M	CCD-472	GP247	5HK-D47
C25	.0015 400V		P488N-0015	D6-152	CUB6D15	6DP-1-152	GEM-6215	6TM-D15
C26	4700		BPD-0047	DD-472	BYA10D47M	CCD-472	GP247	5HK-D47
C27	100 N150	Note 1				*		10TCP-T10
C28	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C29	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C30	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C31	680		DI-680	DD-681	BYA10T68	CCD-681	GP368	10TS-T68
C32	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10

Note 1. Not used in some versions.
† Alternate Value.
* Not normally found in distributor's stock. Available thru distributor on order to manufacturer.

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Curtis Mathes PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	1. 5meg 200K Tap	½	2A21					Loudness, Channel 1. Note 1
B	1. 5meg 200K Tap	½						Loudness, Channel 2. Note 1
R2A	500K	½	2A16	B-60	A47-500K-Z	Q13-133	U48	Balance. Note 2
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R3A	1meg	½	2A6	B-70	AD47-1meg-Z		FA16A	Bass, Channel 2
B	1meg	½		SR-70	Not Req.		RU16A	Bass, Channel 1
C	Shaft			Not Req.	KSS-3		CS3500	
R4A	1meg	½	2A6	B-70	AD47-1meg-Z		FA16A	Treble, Channel 2
B	1meg	½		SR-70	Not Req.		RU16A	Treble, Channel 1
C	Shaft			Not Req.	KSS-3		CS3500	
R5A	400Ω	2(WW)	8A6	WN-401	A43-400	W11-202		Hum
B	Shaft			Not Req.	FKS 1/4	SK5		

Note 1. Some versions may use 3meg dual (Part #2A17).
Note 2. Not used in some versions.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R6	1meg	
R7	82K	(220K) *
R8	6. 8meg	
R9	180K	
R10	1500Ω	
R11	470K	
R12	33K	
R13	180K	
R14	330K	
R15	470Ω	
R16	2200Ω	(9100Ω, 5600Ω) *
R17	220K	
R18	1meg	
R19	100K	

ITEM No.	RATING	REMARKS
R20	2200Ω	
R21	100K	
R22	100K	
R23	100K	
R24	130Ω 5W	# 8A3
R25	82K	(220K) *
R26	6. 8meg	
R27	180K	
R28	1500Ω	
R29	470K	
R30	33K	
R31	180K	
R32	330K	
R33	470Ω	

ITEM No.	RATING	REMARKS
R34	220K	
R35	9100Ω	(3900Ω, 2200Ω)*
R36	12K	
R37	1meg	
R38	100K	
R39	2200Ω	
R40	100K	
R41	100K	
R42	100K	
R43	130Ω 5W	# 8A3
R44	1000Ω 2W	
R45	10K	
R46	270K	
R47	47K	

* Alternate Value.
\# Curtis Mathes Part Number.

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	Curtis Mathes PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V Ⓐ 1. 2A	600 VCT Ⓐ. 170A	5V Ⓐ 3A	12A2A ①						

① Alternate Part #12A2

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	Curtis Mathes PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	4500Ω CT	3-4Ω	10A3-1	24S42	A-2905		A-3880	24S42	S-57Z	
T3	4500Ω CT	3-4Ω	10A3	24S42	A-2905		A-3880	24S42	S-57Z	

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	Curtis Mathes PART No.	QUAM PART No.	
SP1	12"	PM	3-4Ω	12LB-38A	12A6A	
SP2	8"	PM	6-8Ω	8EV-39	8A1Z8. 4	
SP3	5"	PM	6-8Ω	5CM-98	5A15	
SP4	12"	PM	3-4Ω	12LB-38A	12A6A	
SP5	8"	PM	6-8Ω	8EV-39	8A1Z8. 4	
SP6	5"	PM	6-8v	5CM-98	5A15	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA								
	Curtis Mathes PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		JENSEN PART No.		SONOTONE PART No.	
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE
M1		13T	Not Req.	13	Not Req.			10T2-S	N-10T2-S

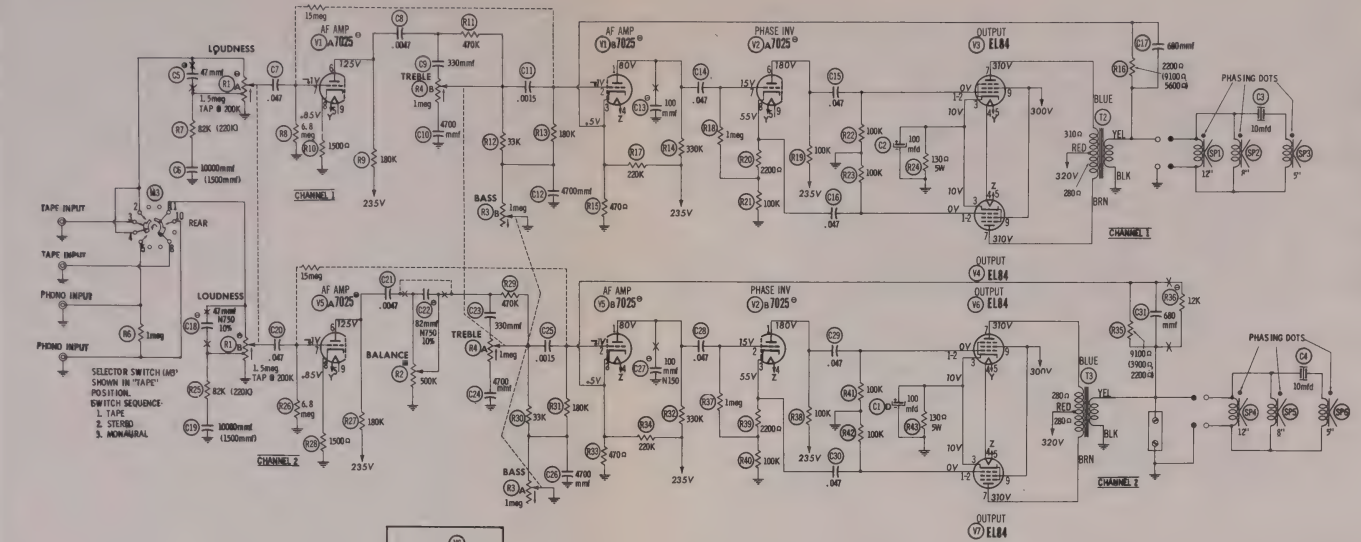
PHONO NEEDLE

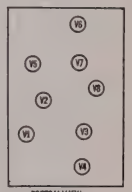
(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

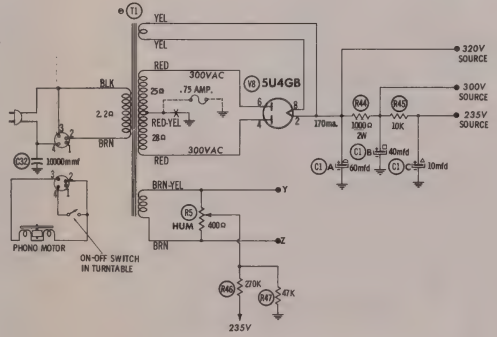
ITEM No.	REPLACEMENT DATA			REMARKS
	Curtis Mathes PART No.	CLEVITE WALCO PART No.	JENSEN PART No.	
M2		* W-204STS † or * W-204DS ♦	* A-44X † or *A-44XSD †♦ or * A-44XDD ♦	† Jewel ♦ Diamond * Includes Cartridge

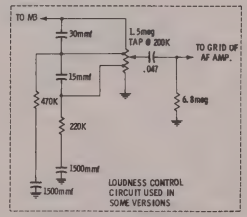
MISCELLANEOUS

ITEM No.	PART NAME	Curtis Mathes PART No.	NOTES
M3	Switch	6A3	Selector (Tape, Stereo-Mono)









RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	7025	†340K	180K	470Ω	47K	47K	†190K	6.8meg	1500Ω	47K
V2	7025	†110K	1.1meg	100K	47K	47K	†110K	1.1meg	100K	47K
V3	EL84 6BQ5	100K	100K	130Ω	47K	47K	NC	†310Ω	NC	†1000Ω
V4	EL84 6BQ5	100K	100K	130Ω	47K	47K	NC	†280Ω	NC	†1000Ω
V5	7025	†340K	180K	470Ω	47K	47K	†190K	6.8meg	1500Ω	47K
V6	EL84 6BQ5	100K	100K	130Ω	47K	47K	NC	†280Ω	NC	†1000Ω
V7	EL84 6BQ5	100K	100K	130Ω	47K	47K	NC	†280Ω	NC	†1000Ω
V8	5U4GB	NC	¶	NC	28Ω	NC	25Ω	NC	¶	

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 8 OF V8.
NC NO CONNECTION

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

❶ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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CURTIS MATHES MODELS 49MD, 59MD, 69MD, 149MD, 159MD, 169MD (Ch. 9)

PHOTOFACT® Folder

EICO MODELS
HF-50, HF-60

EICO MODELS
HF-50, HF-60

MODEL HF-60

EICO MODELS
HF-50, HF-60

TRADE NAME	Eico Models HF-50, HF-60
MANUFACTURER	Electronic Instrument Co., Inc., 33-00 Northern Blvd., Long Island City 1, N. Y.
TYPE SET	AC Operated 5 Tube Audio Amplifier
POWER SUPPLY	110-130 Volts AC, 60 Cycles RATING 135 Watts, 1.3 Amp. @ 117 Volts AC

ADJUSTMENTS

BIAS PREADJUSTMENT

Connect the DC probe of a VTVM to point Ⓐ, common to chassis. Adjust Bias (R2) for -47 volts on VTVM.

BALANCE ADJUSTMENT

Connect VTVM leads across the two Meter Jacks located on rear chasis apron. Adjust balance control (R3) for zero or MINIMUM deflection.

FINAL BIAS ADJUSTMENT

Connect DC probe of VTVM to either Meter Jack (Use lowest DC scale), common to chassis. Adjust Bias (R2) for 0.65 volts on VTVM.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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JX648

SET 485 FOLDER 8

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE
V1	AF Amplifier	EF86/6267.
V2	AF Amplifier	6SN7GTB
V3	Output	EL34/6CA7
V4	Output	EL34/6CA7
V5	Rectifier	GZ34

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	EICO PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▲20	500	24007	AFH2-69	B0500	FP284	TMD-61	TVL-2935	
B	▲20	500							
C2A	▲20	500	24007	AFH2-69	B0500	FP284	TMD-61	TVL-2935	
B	▲20	500							
C3	50	150	23015	PRS1480	BR5015	TC49	TD-50-150	TVA-1414	
C4	50	150	23015	PRS1480	BR5015	TC49	TD-50-150	TVA-1414	
C5	50	25	23007	SRE25V50	BBR50-25	TC29	TD-50-25	TE-1209	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA: AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C6	.05 400V 10%		V84C4S5-10%		PM4S5	4DP-3-503	GEM-1615	4TM-S5
C7	100 10%		DI-100	DD-101	L10T1	CCD-101	GP310	10TS-T10
C8	.25 400V 10%		V84C4P25-10%		PM4P25	4DP-5-254	GEM-4025	4TM-P25
C9	.25 600V 10%		V84C6P25-10%		PM6P25	6DP-5-254	GEM-6025	6TM-P25
C10	.25 600V 10%		V84C6P25-10%		PM6P25	6DP-5-254	GEM-6025	6TM-P25
C11	750 10%		DI-750	DD-751	1R5T75	CCD-751	GP375	10TS-T75
C12	500 10%		DI-500	DD-501	5R5T5	CCD-501	GP350	10TS-T50
C13	175 10%		DI-180	DD-181	L10T18	CCD-181	GP318	10TS-T18
C14	.03 600V		P688N-03	DD-303	CUB6S3	6DP-3-303	GEM-613	6TM-S3

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA: EICO PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1meg	½	16016	AB-70	A47-1meg-Z	B13-137	U53	Level Adjust
B	Shaft			AK-1	FKS-1/4	SK2	Not Req.	
R2A	10K	½	18015	AB-14	B47-10K-S	Q11-116	U20	Bias Adjust
B	Shaft			AK-1	Not Req.	Not Req.	Not Req.	
R3	50K	½	18029	BX-31	B47-50K-S	Q11-123	PTA54L	Balance Adjust

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

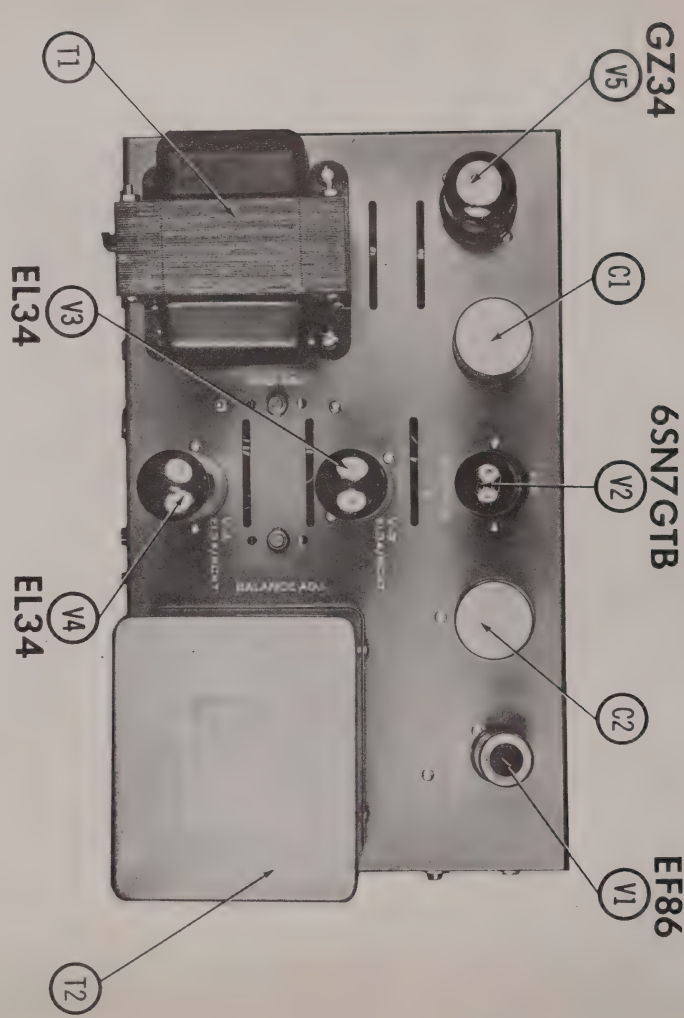
ITEM No.	RATING	REMARKS
R4	4700Ω	
R5	100K 5%	
R6	10K	
R7	470K 5%	
R8	1600Ω 5%	
R9	100Ω 5%	
R10	1meg	
R11	27K 5% 1W	

Note 1. Not used in some versions.

ITEM No.	RATING	REMARKS
R12	33K 5% 1W	
R13	18K 5% 1W	
R14	270K	
R15	15K 1W	Note 1
R16	180K 5%	
R17	100K 5%	
R18	10Ω 1W	
R19	180K 5%	

ITEM No.	RATING	REMARKS
R20	100K 5%	
R21	10Ω 1W	
R22	3000Ω 5%	
R23	3000Ω 5%	
R24	15K 1W	
R25	33K	
R26	22K	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	EICO PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No
T1	121-132V Tap @ 117V @ 1.3A	800VCT @ .150A Tap @ 80V @ .001A	5V @ 1.9A	30020	24R38 ①			P-4004 ①	24R38 ①	
	SEC. 3	SEC. 4	SEC. 5							
	6.3V @ 3.9A									

① Parallel and phase 6.3V Filament Windings. Tape and ignore 2.5V and center taps on 5V and 6.3V windings.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	EICO PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	4000Ω CT Tap @ 620Ω CT	16Ω Tap @ 8Ω, 4Ω	32006 ①							① Part #32007 used in Model HF-50

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA					NOTES
	CURRENT (Measured)	EICO PART No.	INTERNATIONAL PART No.	ITT PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	
M1	.001A	93003 *	RS050 *	1234AH *	Model 50 *		* Selenium Type

FUSES

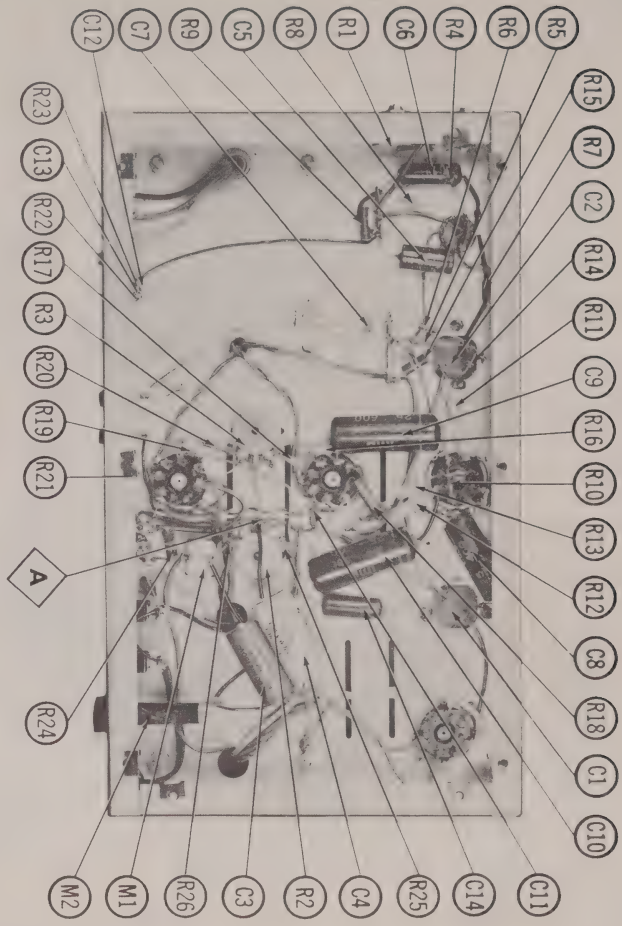
ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			EICO PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	3AG	3A 250V	91005	97800	312003	342001	AGC3	HKP

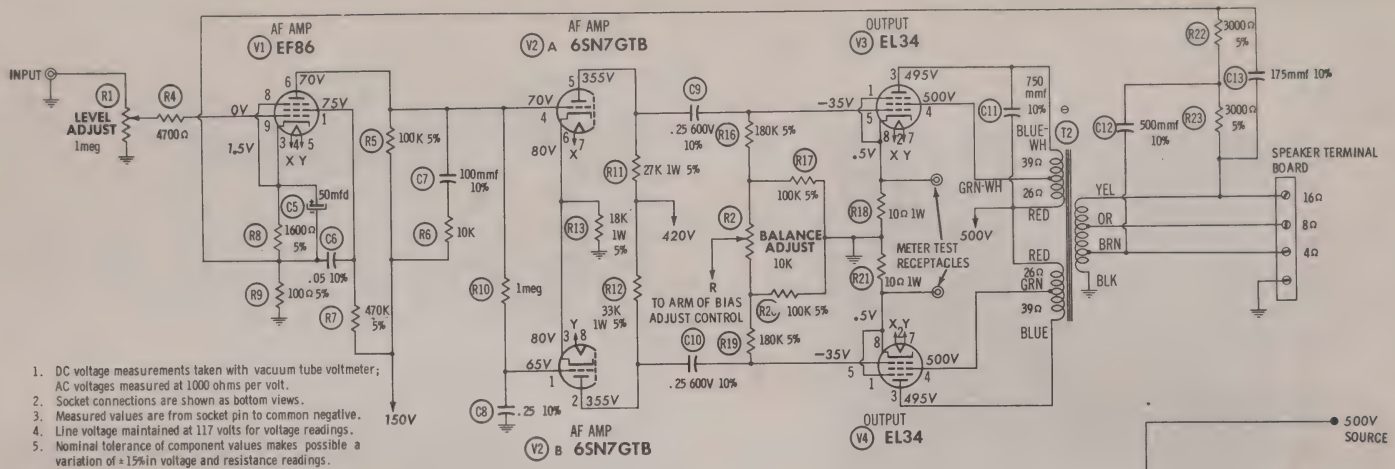
WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

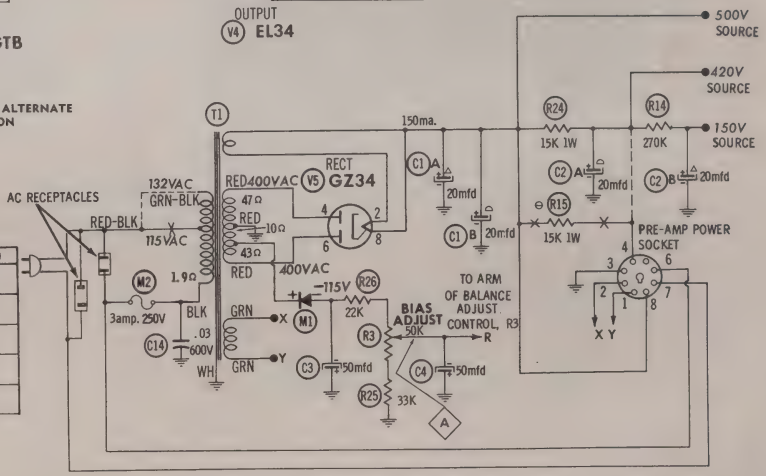
CHASSIS—BOTTOM VIEW





1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	EF86 6267	†755K	0Ω	1700Ω	INF	INF	†385K	0Ω	1700Ω	4700Ω
V2	6SN7GTB	†1.4meg	†48K	18K	†385K	†42K	18K	INF	INF	
V3	EL34 6CA7	10Ω	INF	†65Ω	†26Ω	200K	TP	INF	10Ω	
V4	EL34 6CA7	10Ω	INF	†65Ω	†26Ω	200K	TP	INF	10Ω	
V5	GZ34	NC	¶	NC	47Ω	NC	53Ω	NC	¶	

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 8 OF V5.
NC NO CONNECTION TP TIE POINT

EICO MODELS HF-50, HF-60

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PHOTOFACT® Folder

EMUD MODELS
186, 196

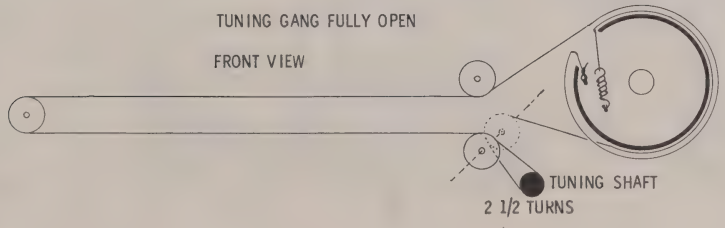
EMUD MODELS
186, 196

MODEL 196

EMUD MODELS
186, 196

TRADE NAME	Emud Models 186, 196		
IMPORTER	Delmonico International Corp., 42-24 Orchard Street, Long Island City 1, N. Y.		
TYPE SET	AC Operated 6 Tube FM-AM Receiver		
POWER SUPPLY	110-120 Volts AC, 60 Cycles	RATING	64 Watts, .59 Amp. @ 117 Volts AC (FM)
TUNING RANGE-BROADCAST	515-1620KC	FREQ. MOD.	88-108MC

DIAL CORD STRINGING



HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of JK681

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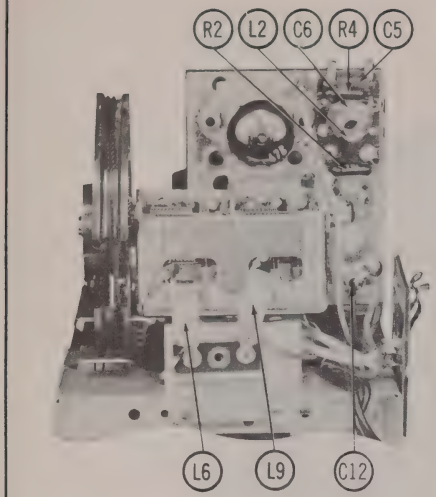
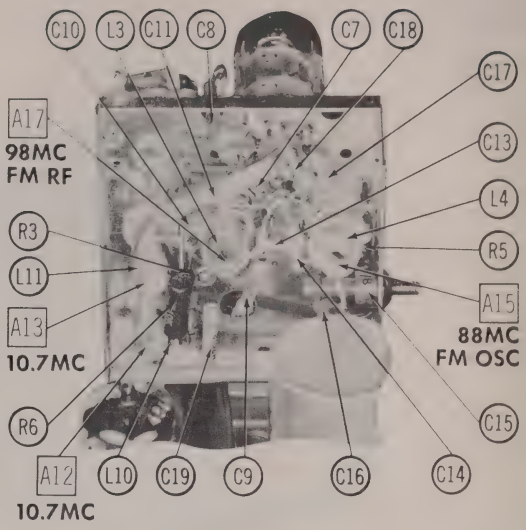
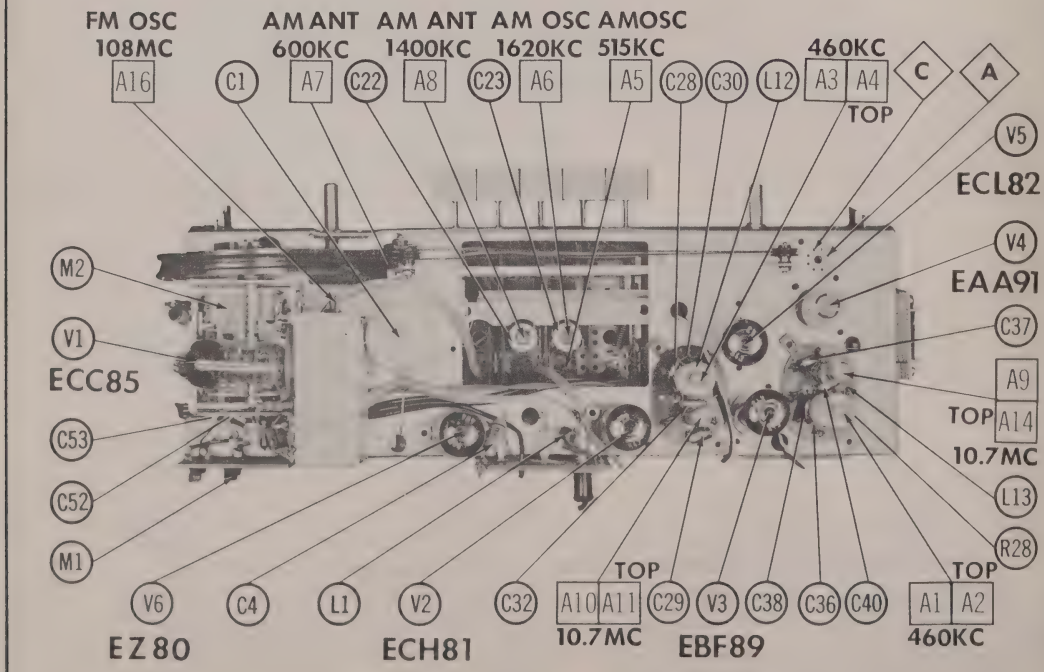
SET 485 FOLDER 9



FM RF SUBCHASSIS - TOP VIEW



FM RF SUBCHASSIS - BOTTOM VIEW



CHASSIS - TOP VIEW

ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

Use only enough generator output to provide a usable indication on VTVM.
Suggested Alignment Tools: A15, A17..... GENERAL CEMENT #8282, 8606, 8606-L, 9091
WALSCO #2526, 2541, 2542, 2543, 2544
A16 ..... GENERAL CEMENT #8721, 8722
WALSCO #2519

AM ALIGNMENT - AM BUTTON DEPRESSED

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	High side to pin 2 (grid) of AM Mixer. Low side to chassis.	460KC (400∿ Mod)	(AM) Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.	Loop	515KC	Tuning gang fully closed	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.	"	1620KC	Tuning gang fully closed	"	A6	"
4.	"	600KC	600KC	"	A7	"
5.	"	1400KC	Tune to 1400KC signal	"	A8	Adjust for maximum output while rocking tuning gang.

FM IF ALIGNMENT USING SIGNAL GENERATOR AND VTVM - FM BUTTON DEPRESSED

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
6.	High side to pin 7 (grid) of FM Converter. Low side to chassis.	10.7MC (Unmod)	FM (Point of non-interference)	DC probe to point Ⓐ. Common to chassis.	A9, A10, A11, A12, A13	Adjust for maximum deflection.
7.	"	"	"	DC probe to point Ⓑ. Common to point Ⓒ.	A14	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING SIGNAL GENERATOR AND OSCILLOSCOPE - FM BUTTON DEPRESSED

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
6.	High side to pin 7 (grid) of FM Converter. Low side to chassis.	10.7MC (450KC Swp)	(FM) Point of non-interference	Vert. Amp. to point Ⓐ : Low side to chassis.	A9, A10, A11, A12, A13	Disconnect stabilizing capacitor (C2). Adjust for maximum gain and symmetry of response similar to Fig. 1. Reconnect C2.
7.	"	"	"	Vert. Amp. to point Ⓑ. Low side to chassis.	A14	Adjust to place marker at the center of cross-over lines similar to Fig. 2 . SLIGHTLY retouch A9 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT - FM BUTTON DEPRESSED

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
8.	Across FM antenna terminals (marked "Dipol" with 120Ω in each lead.	88MC (Unmod)	(FM) 88MC	DC probe to point Ⓐ. Common to chassis.	A15	Adjust for maximum deflection.
9.	"	108MC	108MC	"	A16	"
10.	"	98MC	98MC	"	A17	"

FIG. 1

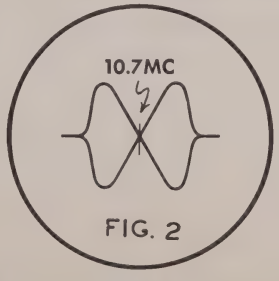
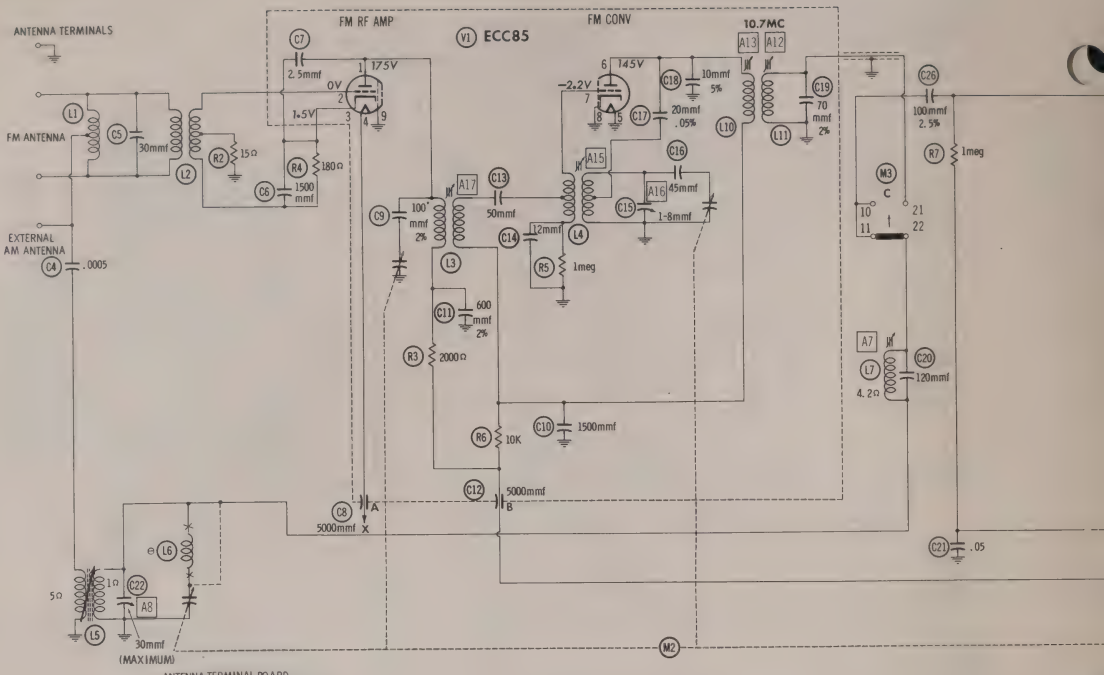


FIG. 2

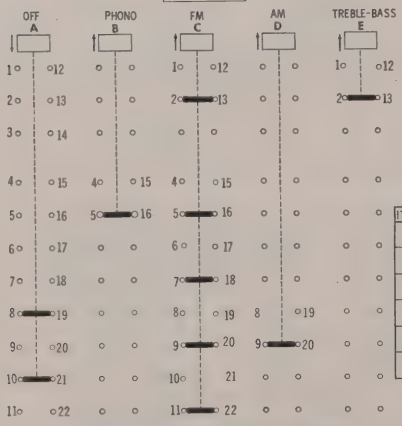


1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)



PUSH-BUTTON SELECTOR SWITCH (M3) SHOWN WITH ALL BUTTONS UNDEPRESSED.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	ECC85	†3000Ω	15Ω	195Ω	.2Ω	0Ω	†11K	1meg	0Ω	0Ω
V2	ECH81	†31K	1meg *2.9meg	0Ω	0Ω	.2Ω	†2000Ω	0Ω *50K	†*34K	0Ω *50K
V3	EBF89	†31K	1meg *2.9meg	0Ω	0Ω	.2Ω	†2000Ω	300K	NC	40K
V4	EAA91	INF	INF	.2Ω	0Ω	0Ω	0Ω	40K		
V5	ECL82	10meg	330Ω	1meg	0Ω	.2Ω	†750Ω	†1000Ω	0Ω	†100K
V6	EZ80	320Ω	NC	¶	.2Ω	0Ω	NC	300Ω	NC	NC

ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE DESIGNATED.
¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 3 OF V6.
* MEASURED IN "AM" POSITION. NC NO CONNECTION

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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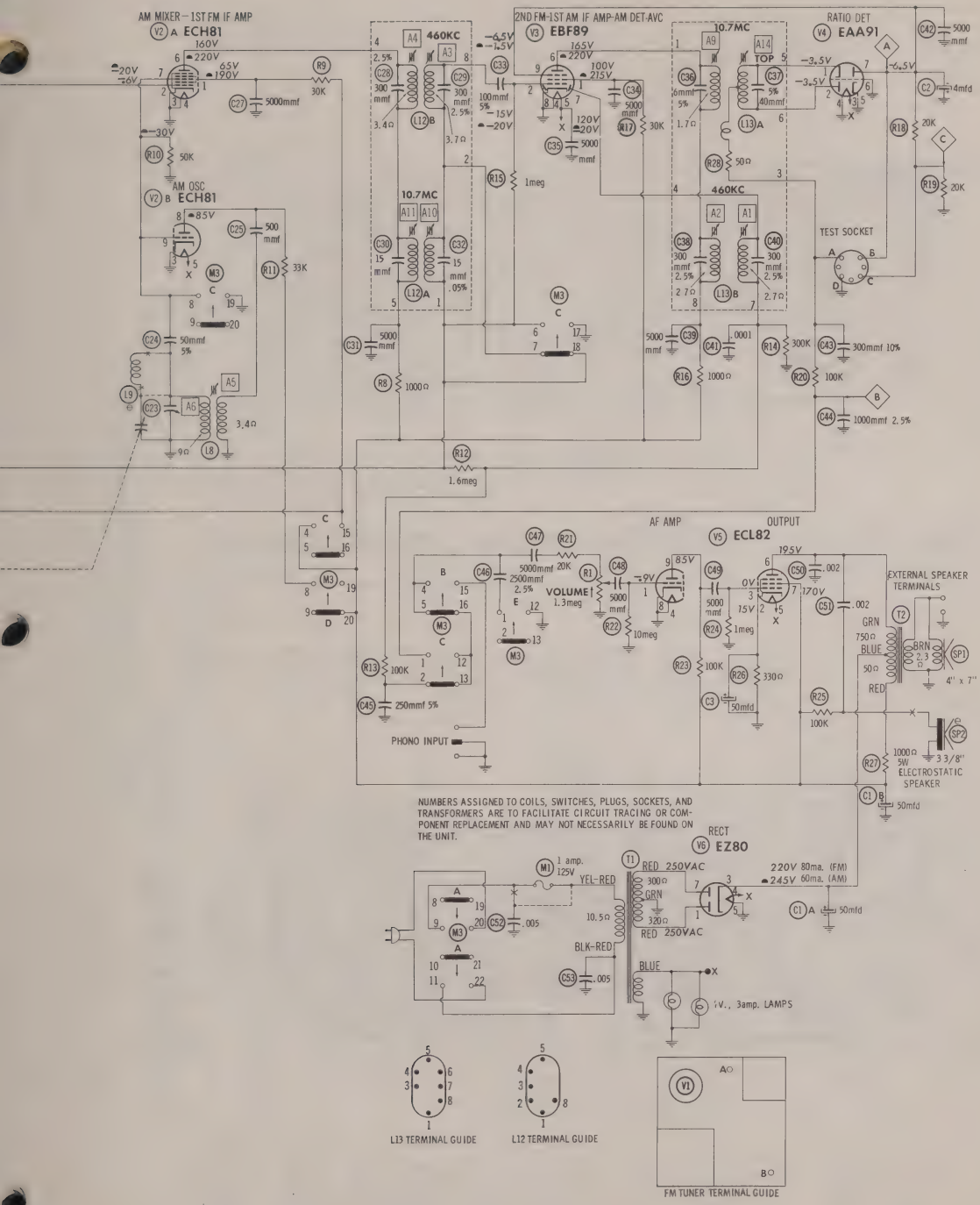
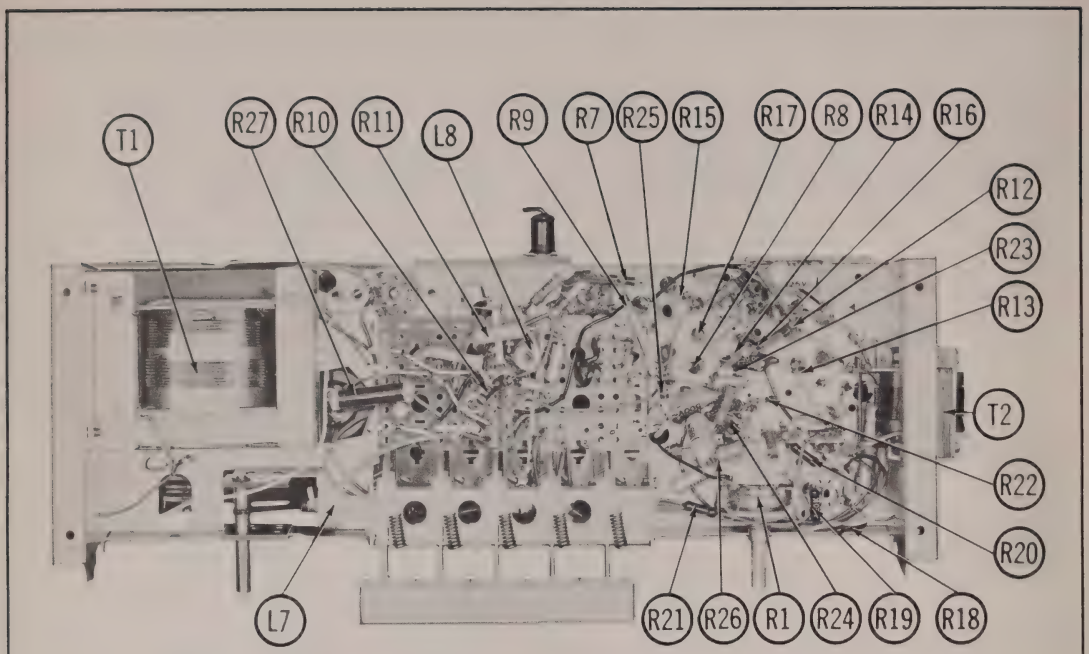
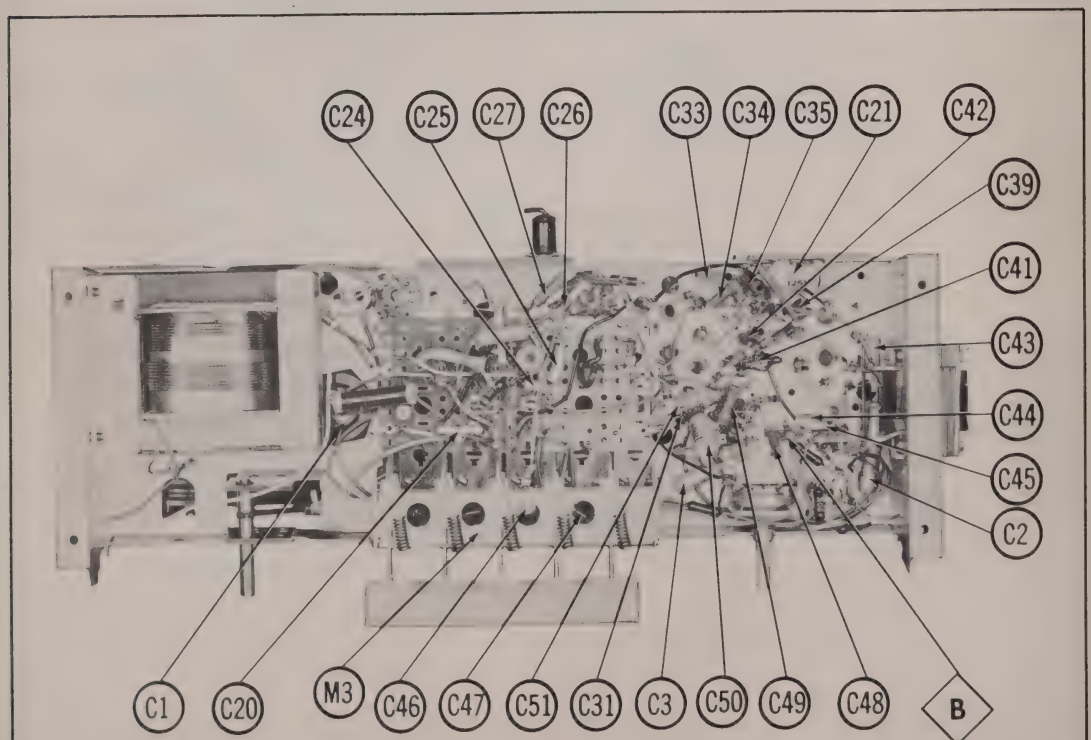


NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

EMUD MODELS 186, 196



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION



CHASSIS-BOTTOM VIEW-CAPACITOR IDENTIFICATION

PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆					
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	FM RF Amp. -FM Conv.	ECC85	V4	Ratio Det.	EAA91
V2	1st FM IF Amp. -AM Mixer-AM Osc.	ECH81	V5	AF Amp. -Output	ECL82
V3	2nd FM IF Amp. -AM IF Amp. -AM Det.-AVC	EBF89	V6	Rectifier	EZ80

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA EMUD PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	50	350				TCD78			
B	50	350							
C2	4	100		PRS1400	BBR4-150	TT150X4	TD-4-150	TE-1403	
C3	50	15		XPP15050	BBR50-25	TT15X50	ML50-15	TE-1160	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C4	.0005 500V		P688N-0005	D6-501	CUB6T5	CCD-501	GP350	6TM-T5
C5	30		DI-30	DD-300	L10Q3	CCD-300	GP430	10TS-Q30
C6	1500		BPD-0015	D6-152	BYA10D15	CCD-152	GP215	5HK-D15
C7	2.5		NPO-DI 2.2	DTZ-2R2	C10V22C	CCTO-2R2	CNO-522	10TCC-V27
C8	5000							
C9	100 2%			TCZ-100		CM-15-E-101G	MCE235	
C10	1500		BPD-0015	D6-152	BYA10D15	CCD-152	GP215	5HK-D15
C11	600 2%					CM-20D-601G		
C12	5000							
C13	50		SI 51	D6-500	L10Q5	CCD-500	GP450	10TS-Q50
C14	12		SI 12	D6-120	L10Q12	CCD-120	GP412	10TS-Q12
C15	1-8							
C16	45		SI 47	D6-470	L10Q47	CCD-470	GP447	10TS-Q47
C17	20 .05%		NPO-SI 20					
C18	10 5%		NPO-SI 10	TCZ-10	C10Q1C	CM-19B-100J	MCE215	10TCC-Q10
C19	70 2%			TCZ-75		CM-15-E-680G		
C20	120		SI 120	D6-121	L10T12	CCD-121	GP312	10TS-T12
C21	.05 125V		P288N-05	DD-503	CUB2S5	4DP-3-503	GEM-415	2TM-S5
C22	30 (Max)							
C23								
C24	50 5%			TCZ-50	C10Q5C	CM-19B-500J	CNO-450	MS-45
C25	500		SI 500	D6-501	BYA10T5	CCD-501	GP350	10TS-T50
C26	100 2.5%			TCZ-100		CM-15-E-101G	MCE235	
C27	5000		SI 5000	D6-502	BYA10D5	CCD-502	GP250	5HK-D50
C28	300 2.5%					CM-15-E-301G	MCE241	
C29	300 2.5%					CM-15-E-301G	MCE241	
C30	15		NPO-SI 15	D6-150	L10Q15	CCD-150	GP415	10TS-Q15
C31	5000		SI 5000	D6-502	BYA10D5	CCD-152	GP250	5HK-D50
C32	15 .05%							
C33	100 5%			TCZ-100	C10T1C	CM-19B-101J	CNO-310	MS-31
C34	5000		SI 5000	D6-502	BYA10D5	CCD-502	GP250	5HK-D50
C35	5000		SI 5000	D6-502	BYA10D5	CCD-502	GP250	5HK-D50
C36	6 5%				C10V6C			10TCC-V56
C37	40 5%			TCZ-39	C10Q39C	CM-19B-390J	CNO-439	10TCC-Q39
C38	300 2.5%					CM-15-E-301G	MCE241	
C39	5000		SI 5000	D6-502	BYA10D5	CCD-502	GP250	5HK-D50
C40	300 2.5%					CM-15-E-301G	MCE241	
C41	.0001 500V		P688N-0001	D6-101	CUB6T1	CCD-101	GP310	6TM-T1
C42	5000		SI 5000	D6-502	BYA10D5	CCD-502	GP250	5HK-D5
C43	300 10%			TCZ-300	L10T3	CCD-301	GP330	10TS-T30
C44	1000 2.5%					CM-20E-102G	MCE255	

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C45	250 5%			TCZ-240	22R5T25	CM-19B-251J	GP325	MS-325
C46	2500 2.5%					CM-20E-252G	MCE460	
C47	5000		SI 5000	D6-502	BYA10D5	CCD-502	GP250	5HK-D50
C48	5000		SI 5000	D6-502	BYA10D5	CCD-502	GP250	5HK-D50
C49	5000		SI 5000	D6-502	BYA10D5	CCD-502	GP250	5HK-D50
C50	.002 500V		P688N-002	D6-202	CUB6D2	6DP-1-202	GEM-622	6TM-D2
C51	.002 500V		P688N-002	D6-202	CUB6D2	6DP-1-202	GEM-622	6TM-D2
C52	.005 500V		P688N-005	D6-502	CUB6D5	6DP-1-502	GEM-625	6TM-D5
C53	.005 500V		P688N-005	D6-502	CUB6D5	6DP-1-502	GEM-625	6TM-D5

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA EMUD PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1.3meg	1/2		AB-70				Volume
B	Shaft			AK-29				

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R2	15Ω	
R3	2000Ω	
R4	180Ω	
R5	1meg	
R6	10K	
R7	1meg	
R8	1000Ω	
R9	30K	
R10	50K	

ITEM No.	RATING	REMARKS
R11	33K	
R12	1.6meg	
R13	100K	
R14	300K	
R15	1meg	
R16	1000Ω	
R17	30K	
R18	20K	
R19	20K	

ITEM No.	RATING	REMARKS
R20	100K	
R21	20K	
R22	10meg	
R23	100K	
R24	1meg	
R25	100K	
R26	330Ω	
R27	1000Ω 5W	
R28	50Ω	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA EMUD PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	FM Ant. Coil							
L2	FM Ant. Trans.							
L3	FM RF Coil							
L4	FM Osc. Coil							
L5	Loopstick							
L6	RF Choke		19-1001	19-1001	BC-562	4604		1.5uh ①
L7	IF Trap Coil							932uh
L8	AM Osc. Coil							
L9	RF Choke		19-1001	19-1001	BC-562	4604		1.5uh ①
L10	1st FM IF Primary							
L11	1st FM IF Secondary							
L12A	2nd FM IF Trans.							
B	1st AM IF Trans.							
L13A	Ratio Det.							
B	2nd AM IF Trans.							

① Not used in some versions.

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	EMUD PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V ⓑ .59A	500VCT ⓐ .080A	6.3V ⓑ 2.4A	BV70720						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	EMUD PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	5300Ω tap @ 6.25%	4-6Ω	BV70725							

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	EMUD PART No.	QUAM PART No.	
SP1 SP2	4" x 7" 3 3/8"	PM Electrostatic*	4-6Ω			* Used in Model 196 only.

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			EMUD PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1		1A 125V						

MISCELLANEOUS

ITEM No.	PART NAME	EMUD PART No.	NOTES
M2 M3	Tuning Cap. Switch		2 Gang Complete (Pushbutton Type) Includes Off-Phono-FM-AM Treble-Bass

WIRING DATA

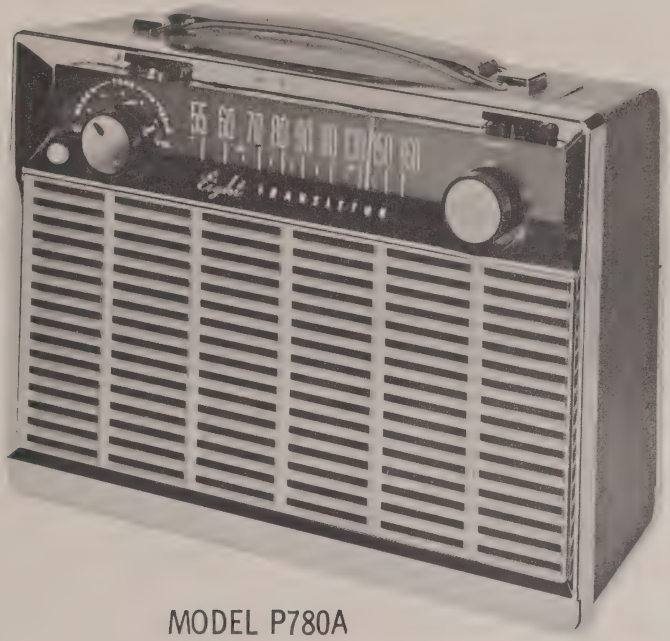
General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

PHOTOFACT® Folder with CIRCUITRACE®

GENERAL ELECTRIC MODELS P780A, B

GENERAL ELECTRIC MODELS P780A, B



MODEL P780A

GENERAL ELECTRIC MODELS P780A, B

TRADE NAME	General Electric Model P780A, P780B
MANUFACTURER	General Electric Co., Product Service, Radio Receiver Dept., 869 Broad Street, Utica, N. Y.
TYPE SET	Battery Operated Transistorized Portable AM Receiver
POWER SUPPLY	9 Volts DC
RATING	11MA @ 9 Volts DC (No Signal, Min. Volume) 30MA @ 9 Volts DC (Signal, Normal Volume)
TUNING RANGE—BROADCAST	540 – 1630KC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested alignment tools: A1, A2, A3, A7.....GENERAL CEMENT #8282, 8606, 8606-L, 9091
WALSCO #2526, 2541, 2542, 2543, 2544
A4, A5, A6.....GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	Loop	455KC (400~ Mod.)	Tuning gang fully open.	Across voice	A1, A2, A3	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
2.	"	1630KC	"	"	A4	"
3.	"	1400KC	1400KC	"	A5, A6	Adjust for maximum output while rocking tuning gang.
4.	"	580KC	Tune to 580KC signal.	"	A7	"

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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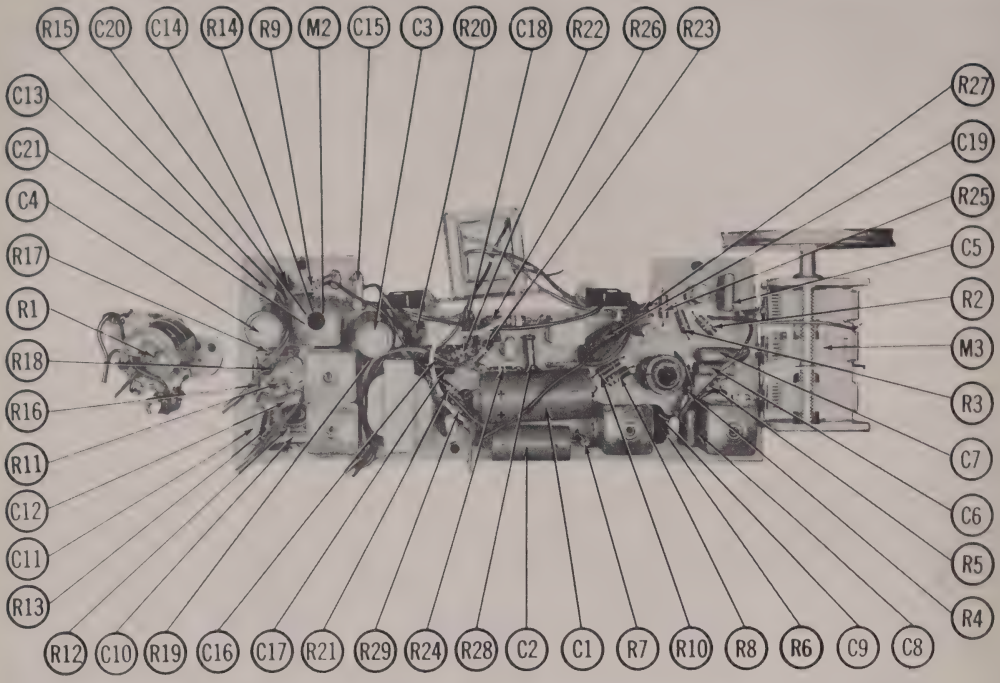
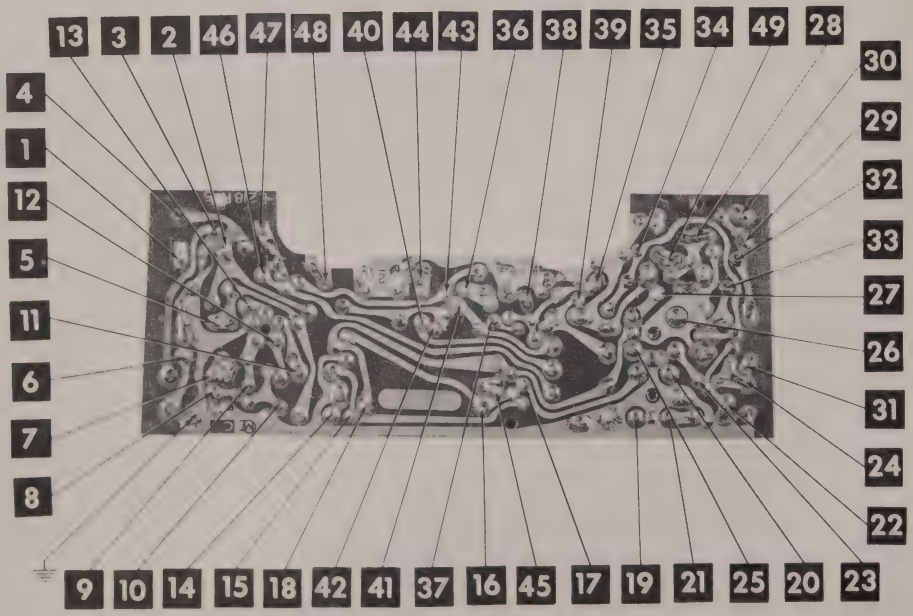
SET 485 FOLDER 10



CHASSIS TOP VIEW – CAPACITOR, RESISTOR & MISC. IDENT.



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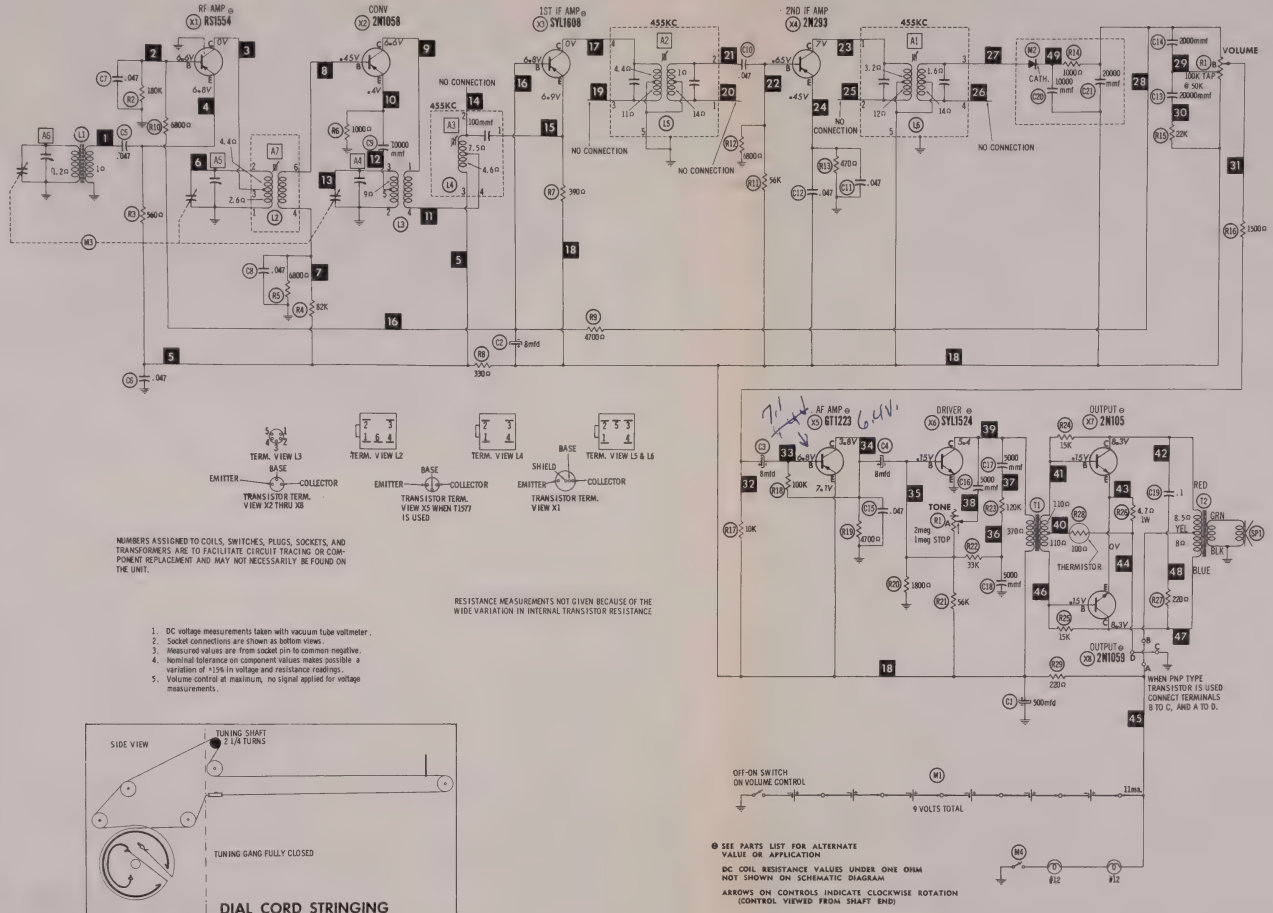
PRINTED BOARD


RF AMP X1 RS1554
CONV X2 2N1058
1ST IF AMP X3 SYL1608
2ND IF AMP X4 2N293
455KC
NO CONNECTION
VOLUME
AF AMP X5 6T1223
DRIVER X6 SYL1524
OUTPUT X7 2N1059
OUTPUT X8 2N1059
TONE
THERMISTOR
RED
GRN
YEL
BLK
BLUE
TERM. VIEW L3
TERM. VIEW L2
TERM. VIEW L4
TERM. VIEW L5 & L6
TRANSISTOR TERM. VIEW X2 THRU X8
TRANSISTOR TERM. VIEW X5 WHEN T1577 IS USED
TRANSISTOR TERM. VIEW X1
NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.
RESISTANCE MEASUREMENTS NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE
1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.
WHEN PNP TYPE TRANSISTOR IS USED CONNECT TERMINALS B TO C, AND A TO D.
OFF-ON SWITCH ON VOLUME CONTROL
9 VOLTS TOTAL
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)
SIDE VIEW
TUNING SHAFT 2 1/4 TURNS
TUNING GANG-FULLY CLOSED
DIAL CORD STRINGING

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE

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GENERAL ELECTRIC MODELS P780A, B

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA				NOTES
			CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	RS1554 *	RF Amplifier		2N544	2N487	2N544	PNP
X2	2N1058	Converter	2N377		2N1366	2N1058	NPN
X3	SYL1608 ♦	1st IF Amplifier			2N486		PNP
X4	2N293	2nd IF Amplifier	2N439		2N1367	2N94	NPN
X5	GT1223 †	AF Amplifier			2N483		PNP
X6	SYL1524 ♦	Driver		2N649		SYL1524	NPN
X7	2N1059 ▲	Output	2N444	2N649	2N632	2N1059	NPN } Matched
X8	2N1059 ▲	Output	2N444	2N649	2N632	2N1059	NPN } Pair

* Type 2N544 may be used in some versions.
♦ Type GT760R, or GE4JX1A813 may be used in some versions.
† Type T1577 may be used in some versions.
♦ Type 4JX2A816 or 2N-1059-1 may be used in some versions.
▲ Type 2N1059-1 (NPN), or 4JX1E850 (PNP), 4JX1E850A (PNP) may be used in some versions.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	G. E. PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1	500	12	RS-2232	PRS1170	BR5001	TC1505	TD-500-15	TVA-1132	
C2	8	10	RS-1592	XPP10008	BBR8-150	TT25X8	TD-8-150	TVA-1405	
C3	8	15	RS-2233	BCD15008	BBR8-150	TT25X8	TD-8-150	TVA-1405	
C4	8	15	RS-2233	BCD15008	BBR8-150	TT25X8	TD-8-150	TVA-1405	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C5	.047 50V		P288N-047	DDA-503	CUB2S47	DP-2-473	GEM-4147	2TM-S47
C6	.047 50V		P288N-047	DDA-503	CUB2S47	DP-2-473	GEM-4147	2TM-S47
C7	.047 50V		P288N-047	DDA-503	CUB2S47	DP-2-473	GEM-4147	2TM-S47
C8	.047 50V		P288N-047	DDA-503	CUB2S47	DP-2-473	GEM-4147	2TM-S47
C9	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C10	.047 50V		P288N-047	DDA-503	CUB2S47	DP-2-473	GEM-4147	2TM-S47
C11	.047 50V		P288N-047	DDA-503	CUB2S47	DP-2-473	GEM-4147	2TM-S47
C12	.047 50V		P288N-047	DDA-503	CUB2S47	DP-2-473	GEM-4147	2TM-S47
C13	20000		BPD-02	DD-203	BYB6S2	CCD-203	GP120	5HK-S20
C14	2000	◆	BPD-002	DD-202	BYA10D2	CCD-202	GP220	5HK-D20
C15	.047 50V		P288N-047	DDA-503	CUB2S47	DP-2-473	GEM-4147	2TM-S47
C16	5000		BPD-005	DD-502	BYA10D5	CCD-502	GP250	5HK-D50
C17	5000		BPD-005	DD-502	BYA10D5	CCD-502	GP250	5HK-D50
C18	5000		BPD-005	DD-502	BYA10D5	CCD-502	GP250	5HK-D50

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C19	.1 50V		P288N-1	DDA-104	CUB2P1	DP-3-104	GEM-201	2TM-P1
C20	10000		C80V103AM	DM-103	H-05S1	CCD-103	TA-110	TG-S10
C21	20000		C80V203AM	DDM-203	H-05S2	CCD-203	TA-120	TG-S20

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	G. E. PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	2meg	½	RS-2229					Tone
B	1meg Stop 100K 50K Tap							Volume
C	Switch							Power Off-On

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R2	180K	
R3	560Ω	
R4	82K	
R5	6800Ω	
R6	1000Ω	
R7	390Ω	
R8	330Ω	
R9	4700Ω	
R10	6800Ω	
R11	56K	

ITEM No.	RATING	REMARKS
R12	6800Ω	
R13	470Ω	
R14	1000Ω	
R15	22K	
R16	1500Ω	
R17	10K	
R18	100K	
R19	4700Ω	
R20	1800Ω	
R21	56K	

ITEM No.	RATING	REMARKS
R22	33K	
R23	120K	
R24	15K	
R25	15K	
R26	4.7Ω 1W	
R27	220Ω	
R28	100Ω	#RS-1995
R29	220Ω	

G. E. Part Number.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		G. E. PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Loopstick	RS-2230	14-7002	14-7002	BC-418			
L2	RF Trans.	RS-2226						
L3	Osc. Coil	RS-2227						
L4	1st IF Trans.	RS-1424						
L5	2nd IF Trans.	RS-2224						
L6	3rd IF Trans.	RS-2225						

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA						NOTES
	PRI.	SEC.	G. E. PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	.8	1	RS-2223						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	G. E. PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	200Ω CT	3-4Ω	RS-2222	TR-114				TR-114		

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	G. E. PART No.	QUAM PART No.	
SP1	5 1/4"	PM	3-4Ω	RB-1128	52A21	

BATTERIES

ITEM No.	VOLTAGE	G. E. PART No.	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
			"A"	"B"	"A"	"B"	"A"	"B"	
M1	1.5V	*		2 *		A100 *		M-13R *	* 6 Required

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		G. E. PART No.	CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M2		RS-1811	1N60	1N60	1N60	Detector (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	G. E. PART No.	NOTES
M3	Tuning Cap.	RS-2228	3 Gang Ant. 15-230mmf, RF 14-235mmf, Osc. 9-73mmf)
M4	Lite Switch		(Normally Open, Spring Loaded)

CABINETS & CABINET PARTS

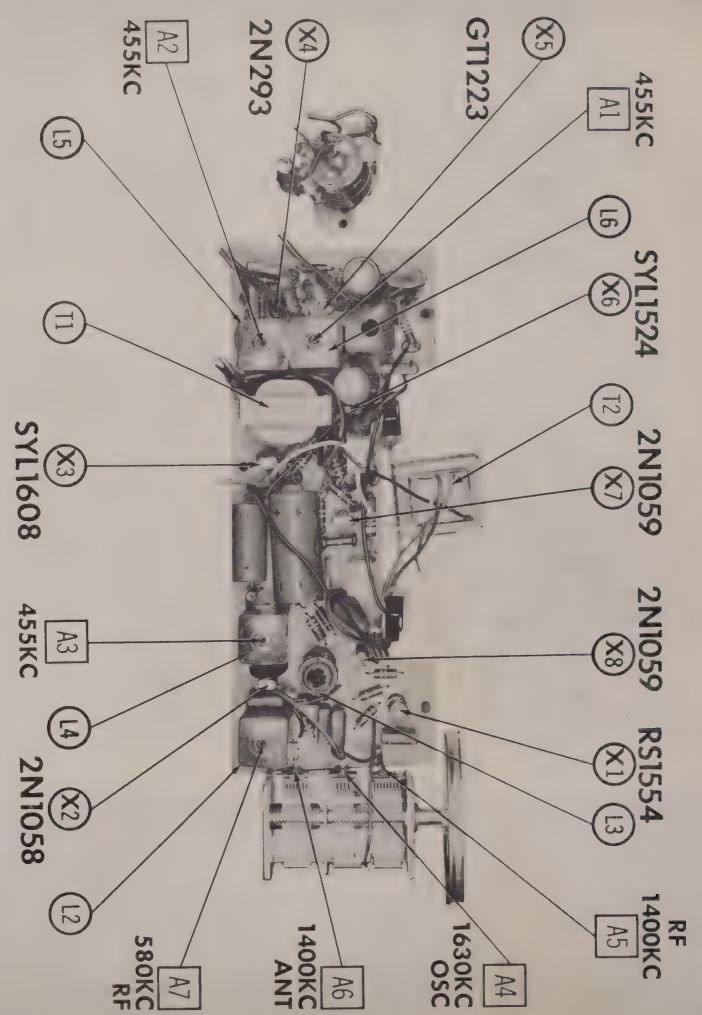
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	RS-2204	Tuning
Knob	RS-2203	Volume
Knob	RS-2205	Tone
Pointer Ass'y.	RS-2208	
Dial Crystal	RS-2202	
Cabinet Front	RB-1125	Model P780A
Cabinet Front	RB-1154	Model P780B
Cabinet Back	RB-1126	
Handle	RS-2221	

WIRING DATA

General-use Unshielded Hook-up Wire .....Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

CHASSIS—TOP VIEW



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**HITACHI MODELS
WH-822, WH-822M**

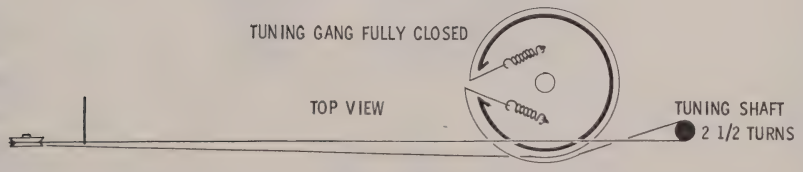
HITACHI MODELS
WH-822, WH-822M

MODEL WH-822M

HITACHI MODELS
WH-822, WH-822M

TRADE NAME	Hitachi Models WH-822, WH-822M		
IMPORTER	Electronic Utilities Co., Div. of the Sampson Co., 2244 S. Western Ave., Chicago 8, Illinois		
TYPE SET	Battery Operated Transistorized 2-Band Portable Receiver		
POWER SUPPLY	6 Volts DC	RATING	7MA @ 6 Volts DC (No Signal, Min. Volume) 25MA @ 6 Volts DC (Signal, Normal Volume)
TUNING RANGE	BROADCAST 535-1605KC	MARINE BAND	1.6-4.5MC

DIAL CORD STRINGING



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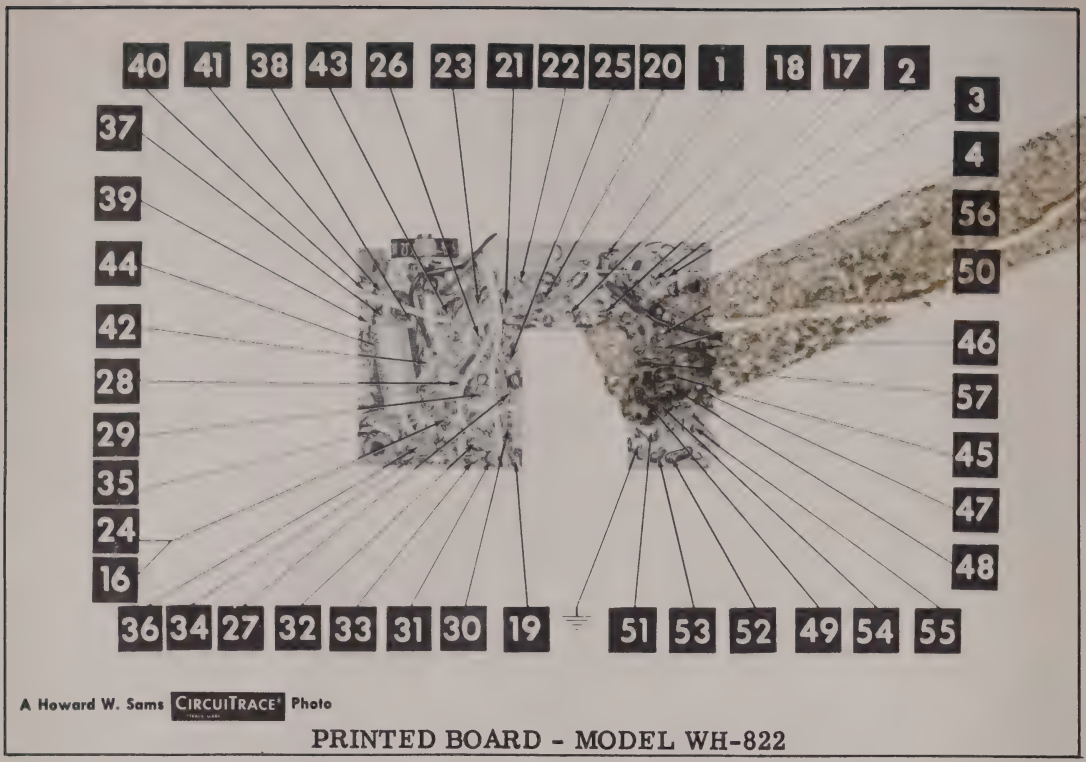
JF790

SET 485 FOLDER 11



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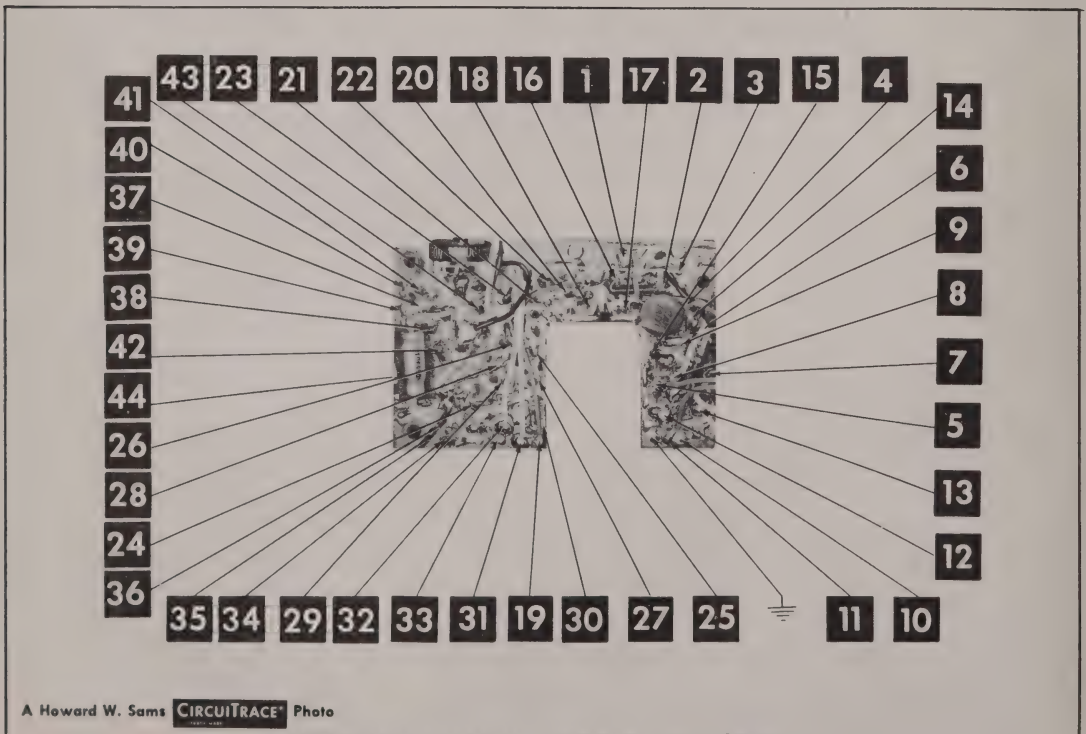
PRINTED BOARD - MODEL WH-822



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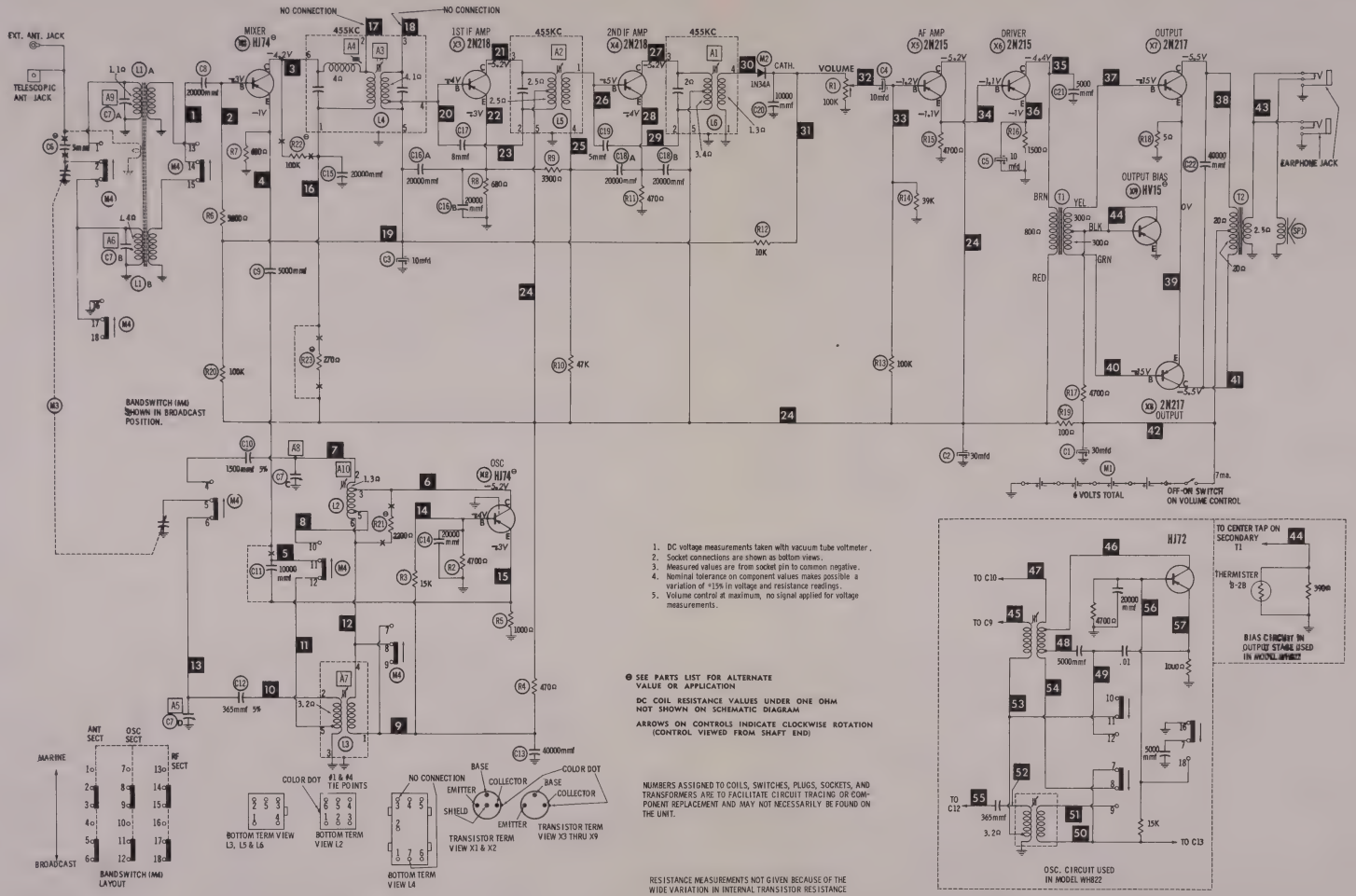
PRINTED BOARD - MODEL WH-822M



1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

❶ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

RESISTANCE MEASUREMENTS NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE

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HITACHI MODELS WH-822, WH-822M

CHASSIS TOP VIEW

HITACHI
MODEL WH-822

FOLDER 11

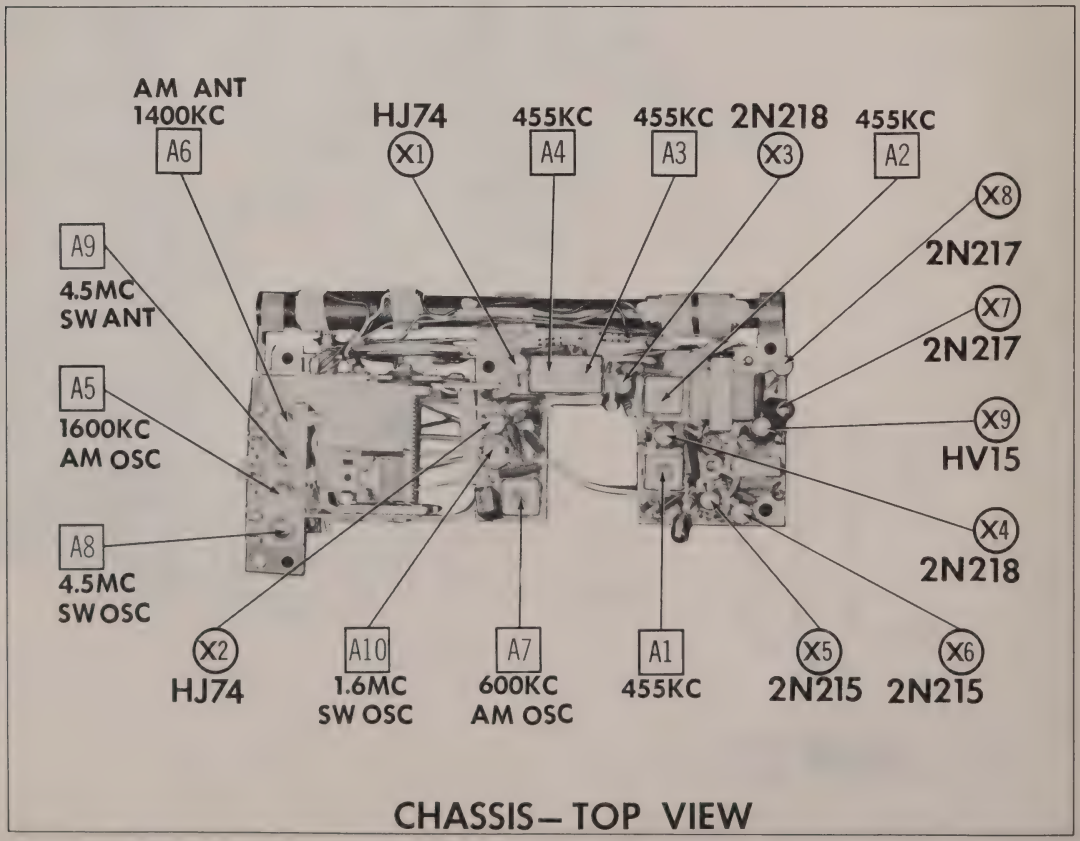
ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools:
- A1 thru A4, A7 ..... GENERAL CEMENT #5004, 5009, 8195, 8274, 8275, 8607, 8728, 8987, 8988, 8989, 9291
  WALSCO #2515, 2520, 2522, 2523, 2531, 2532, 2534, 2537, 2538
- A5, A6, A8, A9 ..... GENERAL CEMENT #8607, 9291, 9294
  WALSCO #2520, 2522, 2523, 2524, 2534, 2537
- A10 ..... GENERAL CEMENT #8282, 8606, 8606-L, 9091
  WALSCO #2526, 2541, 2542, 2543, 2544

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	Loop	455KC (400∿ Mod.)	(BC) Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
2.	"	1600KC	1600KC	"	A5	"
3.	"	1400KC	Tune to 1400KC signal	"	A6	"
4.	"	600KC	Tune to 600KC signal	"	A7	Adjust for maximum output while rocking tuning gang.
5.	High side thru .001mfd to external antenna terminal. Low side to chassis.	4.5MC	(MA) 4.5MC	"	A8, A9	Adjust for maximum output.
6.	"	1.6MC	1.6MC	"	A10	"



CHASSIS—TOP VIEW

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA				NOTES
			CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	HJ74 *	Mixer			2N485		PNP
X2	HJ74 †	Oscillator			2N486		PNP
X3	2N218	1st IF Amplifier		2N410	2N483	2N218	PNP
X4	2N218	2nd IF Amplifier		2N410	2N483	2N218	PNP
X5	2N215	AF Amplifier		2N406	2N362		PNP
X6	2N215	Driver		2N406	2N362		PNP
X7	2N217	Output		2N408	2N633	2N217	PNP) Matched
X8	2N217	Output		2N408	2N633	2N217	PNP) Pair
X9	HV15 ♦	Output Bias					

* Model WH-822 uses HJ72 in this application.
† Model WH-822 uses HJ71 in this application.
♦ Used only in Model WH-822M.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	HITACHI PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1	30	6		XPP6030	NLW30-6		ML30-6	TE-1092	
C2	30	6		XPP6030	NLW30-6		ML30-6	TE-1092	
C3	10	10		XPP-10010	NLW10-10	TT12X10	ML10-15	TE-1114	
C4	10	10		XPP-10010	NLW10-10	TT12X10	ML10-15	TE-1114	
C5	10	6		XPP-6010	NLW10-6	TT6X10	ML10-6	TE-1087	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

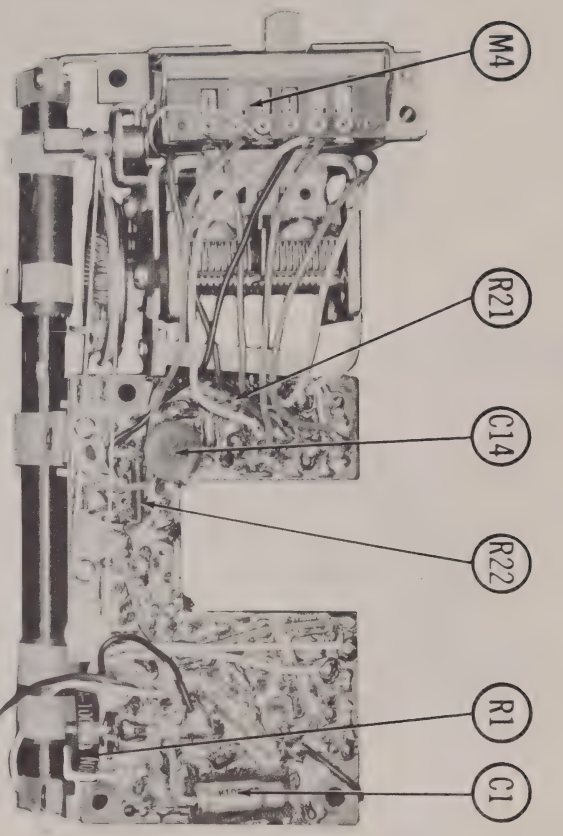
ITEM No.	RATING		REMARKS	REPLACEMENT DATA					
				AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C6	5		Note 1	NPO-SI 5.0	TCZ-4R7	C10V5C	CCTO-050	CNO-547	10TCC-V50
C7A		)							
B		)							
C		)							
D		)							
C8	20000			C80V203AM	DDM-203	H-05S2		TA-120	TG-S20
C9	5000			C80V502AM	DDM-502	H-0505	CCD-502	TA-250	TG-D50
C10	1500	5%		1469-0015			CM-19B-152J		
C11	10000			C80V103AM	DDM-103	H-05S1		TA-110	TG-S10
C12	365	5%		1469-00036		22R5T36	CM-19B-361J		
C13	40000								
C14	20000			C80V203AM	DDM-203	H-05S2		TA-120	TG-S20
C15	20000			C80V203AM	DDM-203	H-05S2		TA-120	TG-S20
C16A	20000			C80V203AM	DDM-203	H-05S2		TA-120	TG-S20
B	20000	)		C80V203AM	DDM-203	H-05S2		TA-120	TG-S20
C17	8			NPO-SI 8.2	DD-080	C10V8C			10TCC-V80
C18A	20000	)		C80V203AM	DDM-203	H-05S2		TA-120	TG-S20
B	20000	)		C80V203AM	DDM-203	H-05S2		TA-120	TG-S20
C19	5			NPO-SI 5.0	TCZ-4R7	C10V5C	CCTO-050	CNO-050	10TCC V50
C20	10000			C80V103AM	DDM-103	H-05S1		TA-110	TG-S10
C21	5000			C80V502AM	DDM-502	H-05D5	CCD-502	TA-250	TG-D50
C22	40000								

Note 1. Not used in Model WH-822.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESIST-ANCE	WATTS	HITACHI PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1	100K	1/4	33.06					Volume & Switch

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R2	4700Ω	
R3	15K	
R4	470Ω	
R5	1000Ω	
R6	5600Ω	
R7	680Ω	
R8	680Ω	
R9	3300Ω	

ITEM No.	RATING	REMARKS
R10	47K	
R11	470Ω	
R12	10K	
R13	100K	
R14	39K	
R15	4700Ω	
R16	1500Ω	
R17	4700Ω	

ITEM No.	RATING	REMARKS
R18	100Ω	
R19	Temp. Comp.	
R20	5Ω	
R21	100Ω	
R22	100K	
R23	2200Ω	Note 1
R24	100K	Note 1
R25	270Ω	Note 1

Note 1. Used in Model WH-822M only.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA: HITACHI PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1A	SW Loopstick							
B	BC Loopstick							
L2	SW Osc. Coil							
L3	BC Osc. Coil							
L4A	1st IF Primary							
B	1st IF Secondary							
L5	2nd IF Trans.							
L6	3rd IF Trans.							

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO PRI.	TURNS RATIO SEC.	REPLACEMENT DATA: HITACHI PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	.7	1	CT-65						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA: HITACHI PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	250Ω	10-12Ω	OT-67				TA-20			

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA: HITACHI PART No.	QUAM PART No.	NOTES
SP1	2 5/8"	PM	10-12Ω	SP-6503	25A07Z12	

BATTERIES

ITEM No.	VOLTAGE	HITACHI PART No.	REPLACEMENT DATA: BURGESS "A"	BURGESS "B"	EVEREADY "A"	EVEREADY "B"	MALLORY "A"	MALLORY "B"	NOTES
M1	1.5V	UM-3 *		930 *		1015 *		M-15R *	* 4 Required

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA: HITACHI PART No.	CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	NOTES
M2	1N34A		1N34A	1N34A	1N34A	Detector (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	HITACHI PART No.	NOTES
M3	Tuning Cap.		2 Gang
M4	Switch		AM-SW (DP 3-Position, Slide Type)

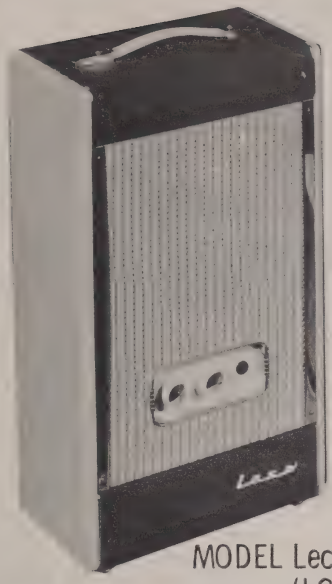
WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

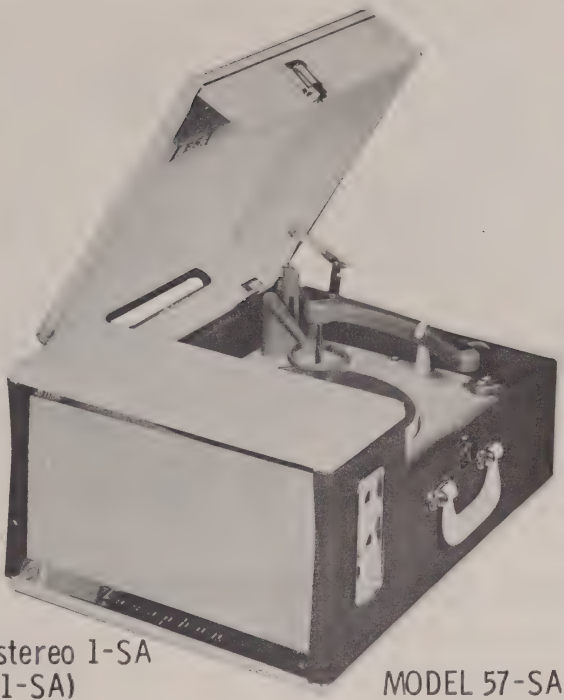
PHOTOFACT® Folder

LESA MODELS
LCS1-SA, 57-SA

LESA MODELS
LCS1-SA, 57-SA



MODEL Lecestereo 1-SA
(LCS1-SA)



MODEL 57-SA

LESA MODELS
LCS1-SA, 57-SA

TRADE NAME	Lesa Model Lecostereo 1/SA, Lesa Model Lesaphon 57/SA
IMPORTER	Lesa of America, Trading and Manufacturing Corp., 11 W. 42nd Street, New York 36, N. Y.
TYPE SET	AC Operated 4 Tube Stereo Amplifier With 4 Speed Automatic Record Changer
POWER SUPPLY	110 - 120 Volts AC, 60 Cycles RATING 54 Watts, .52 Amp. @ 117 Volts AC (Less Motor)

FOR SERVICE INFORMATION ON RECORD CHANGER — SEE LESA CD2/21 — PHOTOFACT SET 479 FOLDER 11

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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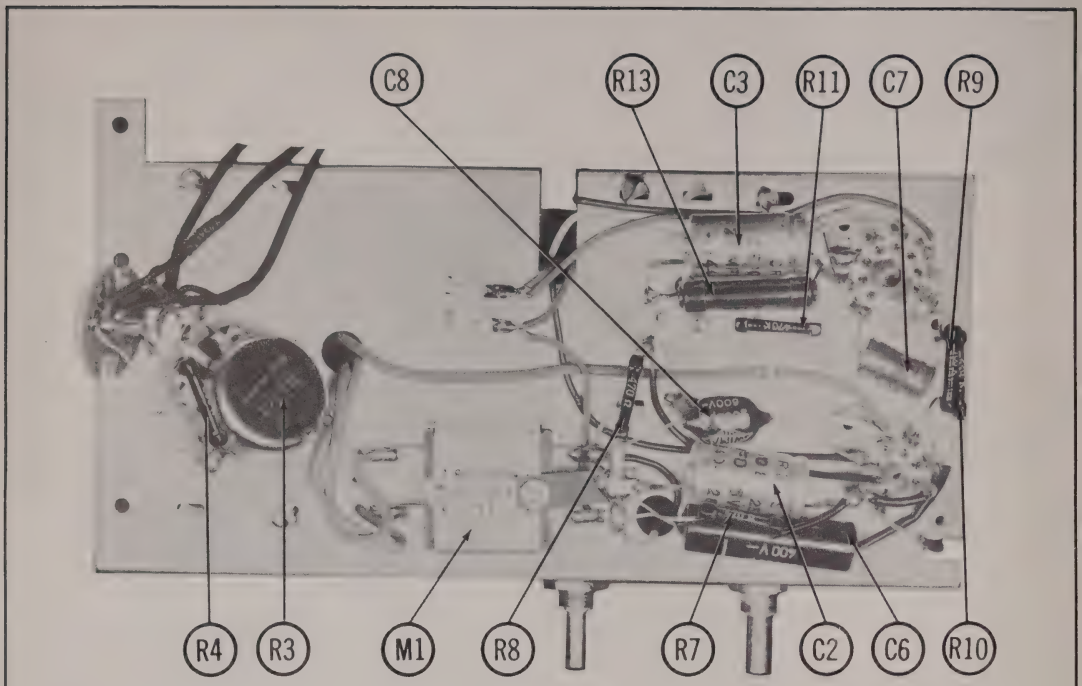
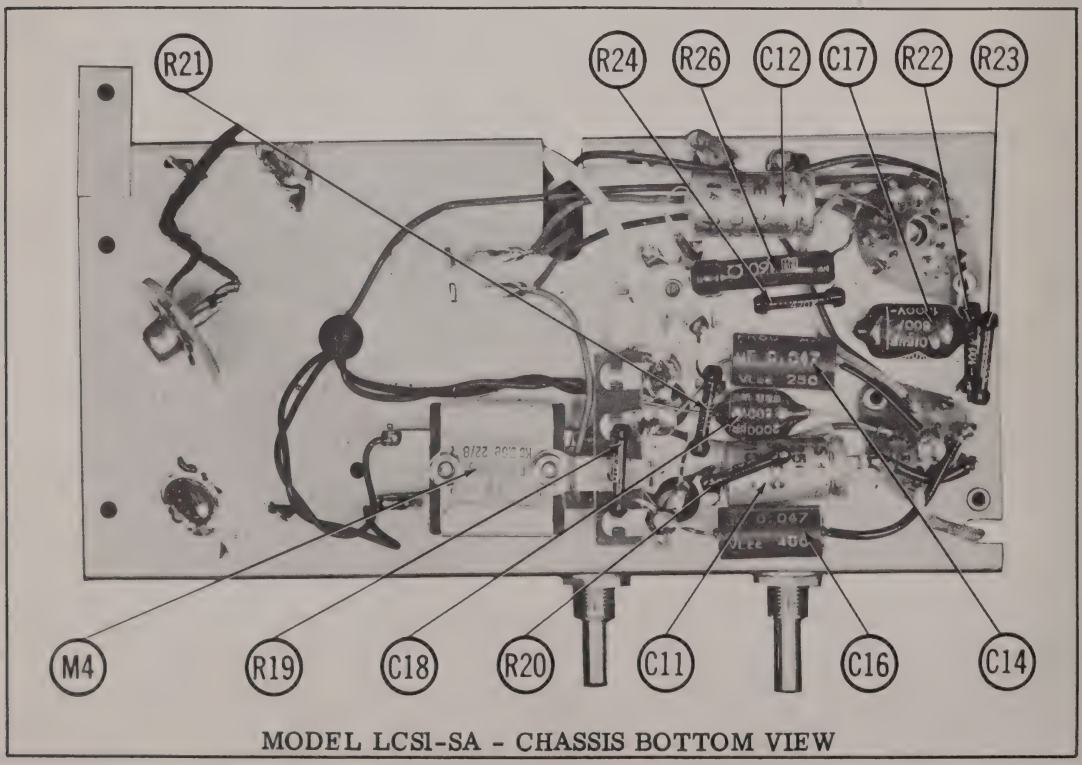


MODEL 57-SA - CHASSIS BOTTOM VIEW



MODEL LCS1-SA - CHASSIS BOTTOM VIEW

MODEL 57—SA PARTS LIST AND DESCRIPTIONS

TUBES

• CBS •	GENERAL ELECTRIC •	RAYTHEON •	SYLVANIA •

ITEM No.	USE	TYPE
V1	Channel 1 AF Amp.	12AU6

ITEM No.	USE	TYPE
V2	Channel 1 Output	35QL6

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	LESA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	40	250		PRS2340	BBRT4425C		TDLT-20		
B	40	250							
C2	25	25		SRE25V25	BBR25-25	TC26	TD-25-25	TE-1207	
C3	25	25		SRE25V25	BBR25-25	TC26	TD-25-25	TE-1207	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C4	.05 400V		P488N-05	DD-503	CUB4S5	4DP-4-503	GEM-415	4TM-S5
C5	.1 600V		P688N-1	DF-104	CUB6P1	6DP-4-104	GEM-601	6TM-P1
C6	.05 400V		P488N-05	DD-503	CUB4S5	4DP-3-415	GEM-415	4TM-S5
C7	.015 400V		P488N-015	DD16-153	CUB6S15	4DP-1-153	GEM-4115	4TM-S15
C8	.002 600V		P688N-002	DD-202	CUB6D2	6DP-1-202	GEM-622	6TM-D2
C9	.05 400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S5

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	LESA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	2meg	1/2	DM14540/7	AB-76				Volume
B	2meg	1/2		SR-76				Volume
C	Shaft			AK-29				
R2A	50K	1/2	DM14539	AB-32				Tone
B	Shaft			AK-29				
C	Switch			KR-1				Power Off-On
R3A	1meg	1/2	DM14538/13	AB-69				Sensitivity
B	Shaft			AK-29				

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R4	330K	
R5	15K	
R6	10K	
R7	470Ω	(500Ω)*

ITEM No.	RATING	REMARKS
R8	470Ω	(500Ω) *
R9	100K	
R10	220K	
R11	470K	

ITEM No.	RATING	REMARKS
R12	5100Ω 2W	(5000Ω) *
R13	1600Ω 1W	
R14	100Ω 1W	

* Alternate Value.

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	LESA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V@ .26A Tap @12V@ .4A, 35V @.3A, 12V @ .3A	180V@ .052A		DM14845						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	LESA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	7500Ω Tap@ 470Ω	3-4Ω	DM14784							

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	LESA PART No.	QUAM PART No.	
SP1	6"	PM	3-4Ω		6A1	

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA					
	CURRENT (Measured)	LESA PART No.	INTERNATIONAL PART No.	ITT PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M1	.075A						Bridge Selenium

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA							
	LESA PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		JENSEN PART No.		SONOTONE PART No.	
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE
M2		13TB	Not Req.	26S	S1-1 S3-3			8TA4-S	N-8TA-S

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	LESA PART No.	CLEVITE WALCO PART No.	JENSEN PART No.	
M3			L-1X † or L-1XD ♦	† Jewel ♦ Diamond

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

MODEL LCS1–SA PARTS LIST AND DESCRIPTIONS

TUBES

• CBS • GENERAL ELECTRIC •			• RAYTHEON • SYLVANIA •		
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V3	Channel 2 AF Amp.	12AU6	V4	Channel 2 Output	35QL6

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	LESA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C10A	40	250		PRS2340	BBRT4425C		TDLT-20		
B	40	250							
C11	25	25		SRE25V25	BBR25-25	TC26	TD-25-25	TE-1207	
C12	25	25		SRE25V25	BBR25-25	TC26	TD-25-25	TE-1207	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C13	.047 250V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C14	.047 250V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C15	.1 250V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1
C16	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C17	.015 600V		P688N-015	DD16-153	CUB6S15	6DP-2-153	GEM-6115	6TM-S15
C18	.002 600V		P688N-002	DD-202	CUB6D2	6DP-1-202	GEM-622	6TM-D2

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	LESA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R15A	2meg	1/2	DM14536/12	AB-76				Volume
B	Shaft			AK-29				
R16A	50K	1/2	DM14538	AB-32				Tone
B	Shaft			AK-29				
C	Switch			KR-1				Power Off-On

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R17	15K	(330K) *
R18	10K	
R19	330Ω	
R20	510Ω	(500Ω) *

ITEM No.	RATING	REMARKS
R21	510Ω	(500Ω) *
R22	100K	
R23	220K	
R24	470K	

ITEM No.	RATING	REMARKS
R25	5100Ω 1W	(5000Ω) *
R26	1600Ω 1W	

* Alternate Value

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	LESA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T3	117V @ .26A Tap @ 12V @ .4A, 35V @ .3A, 12V @ .3A	180V @ .052A		14783						

TRANSFORMER (AUDIO OUTPUT)

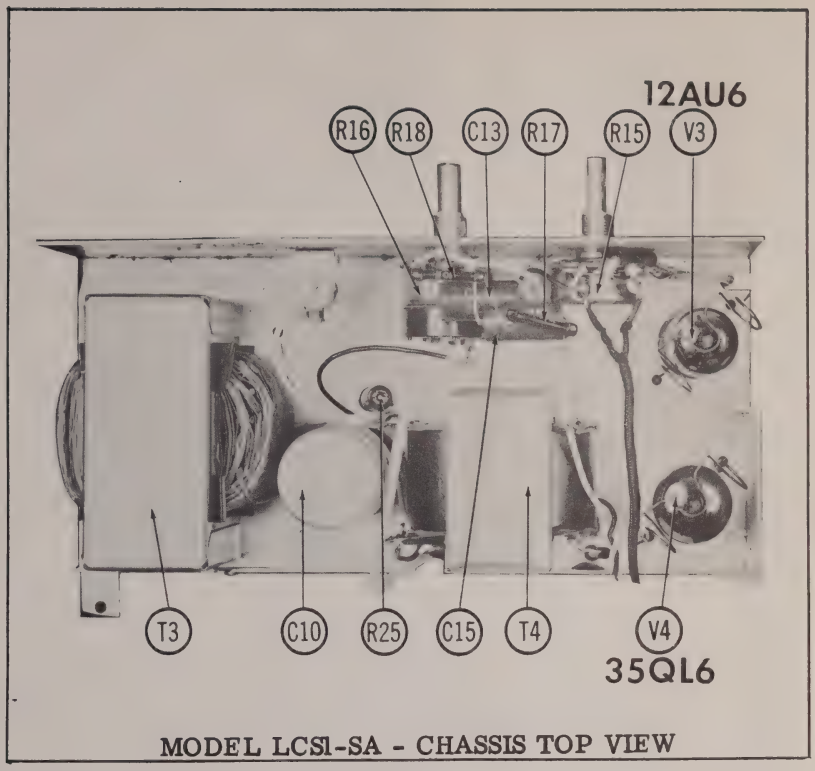
ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	LESA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T4	7500Ω Tap @ 470Ω	3-4Ω	DM14784							

SPEAKER

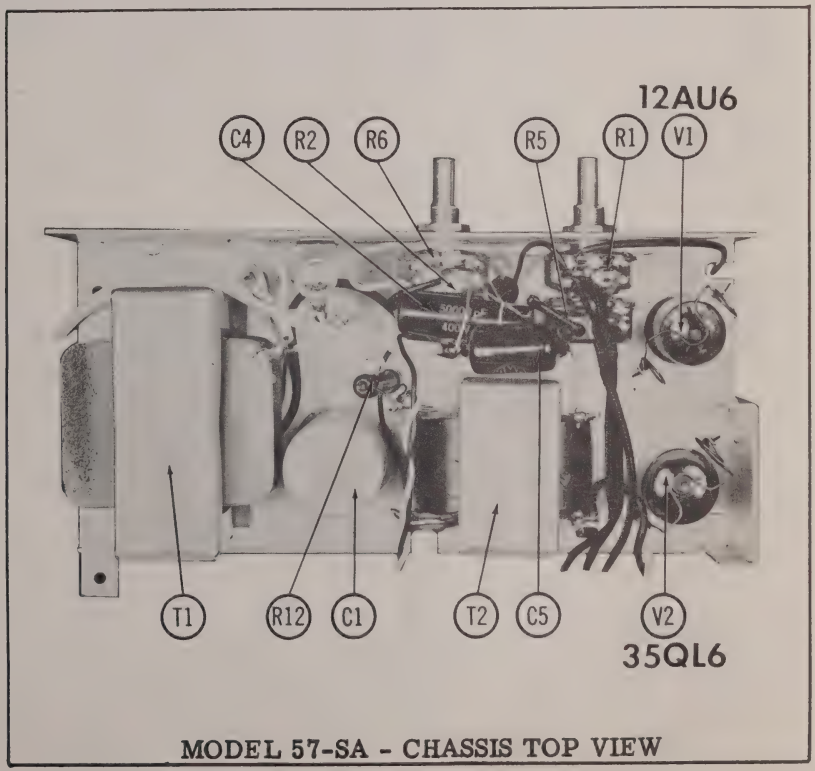
ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	LESA PART No.	QUAM PART No.	
SP2	6"	PM	3-4Ω		6A1	

RECTIFIERS

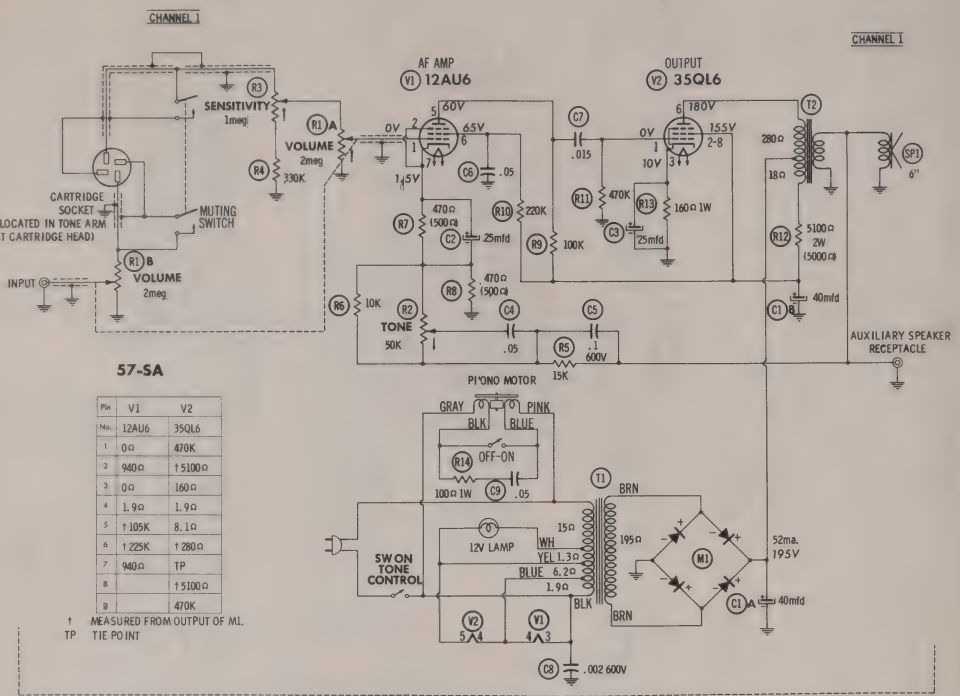
ITEM No.	RATING	REPLACEMENT DATA					NOTES
	CURRENT (Measured)	LESA PART No.	INTERNATIONAL PART No.	ITT PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	
M4	.075A						Bridge Selenium



MODEL LCS1-SA - CHASSIS TOP VIEW



MODEL 57-SA - CHASSIS TOP VIEW



57-SA

Pin No.	V1 12AU6	V2 35QL6
1	0Ω	470K
2	940Ω	†5100Ω
3	0Ω	160Ω
4	1.9Ω	1.9Ω
5	†105K	8.1Ω
6	†225K	†280Ω
7	940Ω	TP
8		†5100Ω
9		470K

† MEASURED FROM OUTPUT OF M1.
TP TIE POINT

Cont.

Pin No.	V3 12AU6	V4 35QL6
1	0Ω	470K
2	1020Ω	††5100Ω
3	0Ω	160Ω
4	1.9Ω	1.9Ω
5	††105K	7.6Ω
6	††225K	††280Ω
7	1020Ω	160Ω
8		††5100Ω
9		470K

†† MEASURED FROM OUTPUT OF M4.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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LESA MODELS
LCS1-SA, 57-SA

PHOTOFACT® Folder with CIRCUITRACE®

MACO MODEL T-16

MACO MODEL T-16

MACO MODEL T-16

TRADE NAME	Maco Model T-16
IMPORTER	Maco Electric Corp., 1776 Broadway, New York 19, N. Y.
TYPE SET	Battery Operated Transistorized Portable AM Receiver
POWER SUPPLY	6 Volts DC
RATING	7MA@6 Volts DC (No Signal, Min. Volume) 15MA@6 Volts DC (Signal, Normal Volume)
TUNING RANGE—BROADCAST	535 - 1605KC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.
Suggested alignment tools: A4, A6....GENERAL CEMENT #5000, 5003, 8276, 8290
WALSCO #2512, 2515, 2522, 2525, 2537, 2523

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	Loop	455KC (400∿ Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2, A3	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
2.	"	1605KC	"	"	A4	"
3.	"	600KC	Tune to 600KC Signal.	"	A5	Adjust for maximum output while rocking tuning.
4.	"	1400KC	Tune to 1400KC Signal.	"	A6	Adjust for maximum output.

SET 485 FOLDER 13

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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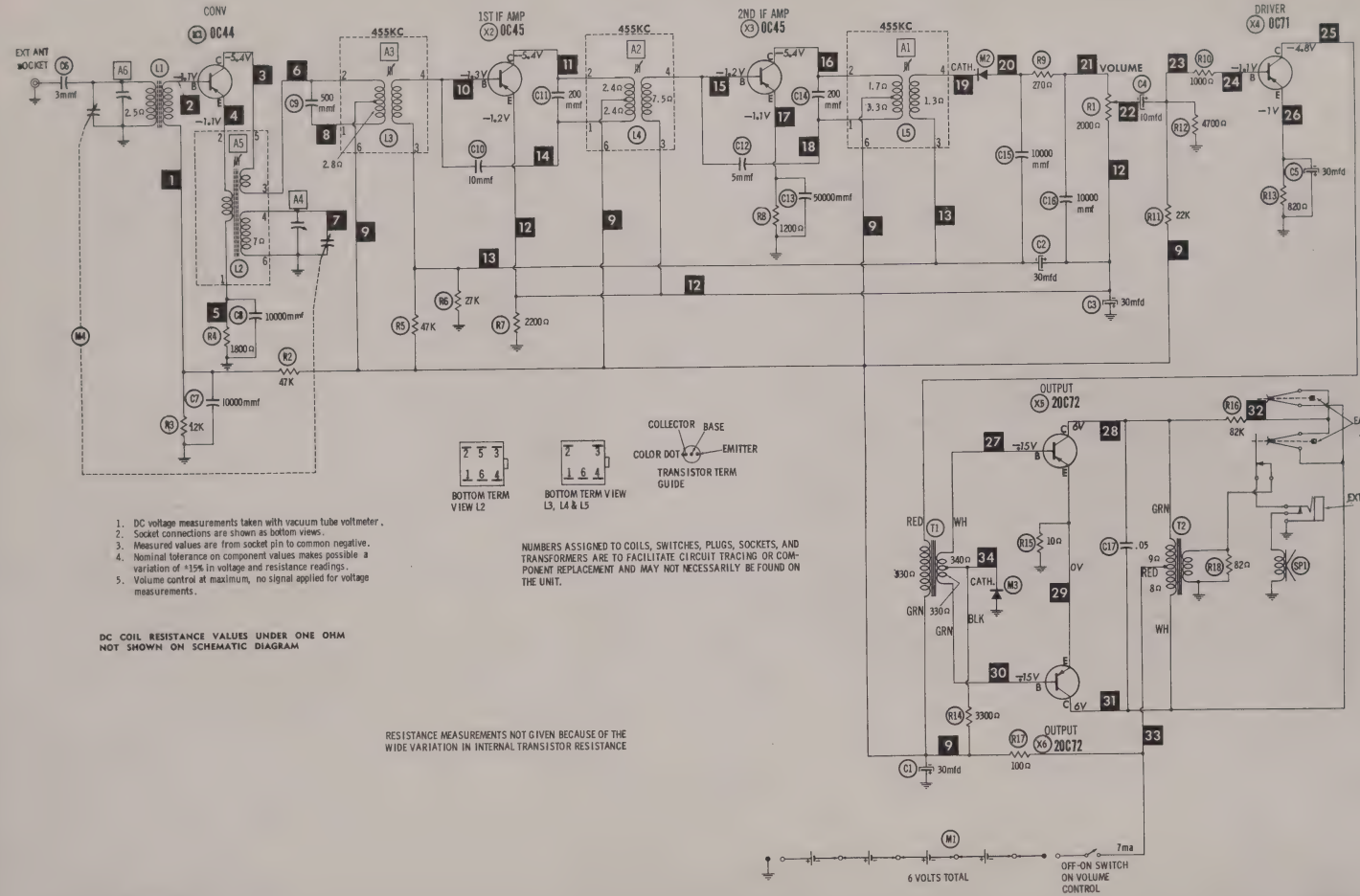

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

RESISTANCE MEASUREMENTS NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE

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MACO MODEL T-16

PARTS LIST AND DESCRIPTIONS

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA				NOTES
			CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	OC44	Converter	2N180		2N486		PNP
X2	OC45	1st IF Amplifier			2N483		PNP
X3	OC45	2nd IF Amplifier			2N483		PNP
X4	OC71	Driver			2N362		PNP
X5	2OC72	Output			2N632		PNP
X6	2OC72	Output			2N632		PNP

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	MACO PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1	30	6	NCT-6V30	XPP-6030	NLW30-6	TT6X30	ML30-6	TE-1092	
C2	30	3	NCT-3V30	XPP-3030	NLW30-6	TT6X30	ML30-6	TE-1092	
C3	30	3	NCT-3V30	XPP-3030	NLW30-6	TT6X30	ML30-6	TE-1092	
C4	10	3	NCT-3V10	XPP-3010	NLW10-3	TT3X10	ML10-6	TE-1053	
C5	30	3	NCT-3V30	XPP-3030	NLW30-6	TT6X30	ML30-6	TE-1092	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA						
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.	
C6	3		NPO-SI 3.0	TCZ-3R3	C10V3C	CCTO-3R3	CNO-533	10TCC-V3	
C7	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10	
C8	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10	
C9	500		SI 500	DD-501	BYA10T5	CCD-501	GP350	10TS-T50	
C10	10		SI 10	DD-100	L10Q1	CCD-100	GP410	10TS-Q10	
C11	200		SI 200	DD-201	L10T2	CCD-201	GP320	10TS-T20	
C12	5		SI 5	DD-050	L10V5	CCD-050	GP550	10TS-V50	
C13	50000		C80V503AM	DDA-503	H-05S5		TA150	5HK-S50	
C14	200		SI 200	DD-201	L10T2	CCD-201	GP320	10TS-T20	
C15	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10	
C16	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10	
C17	.05 250V	#MPC-2503	P482Z-05					5HK-S50	

Maco Part Number.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	MACO PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1	2000Ω	1/4	SNVa-16					Volume & Switch

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R2	47K	
R3	12K	
R4	1800Ω	
R5	47K	
R6	27K	
R7	2200Ω	

ITEM No.	RATING	REMARKS
R8	1200Ω	
R9	270Ω	
R10	1000Ω	
R11	22K	
R12	4700Ω	
R13	820Ω	

ITEM No.	RATING	REMARKS
R14	3300Ω	
R15	10Ω	
R16	82K	
R17	100Ω	
R18	82Ω	

PRINTED BOARD

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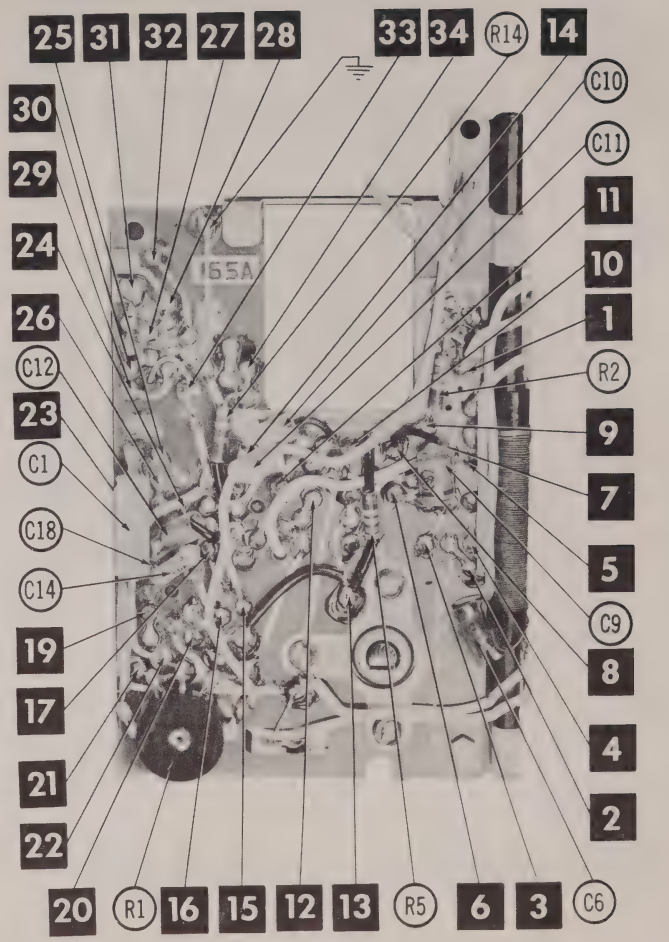


PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		MACO PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Loopstick	AM2012-D						
L2	Osc. Coil	AOS1-E						
L3	1st IF Trans.	#1790-P						
L4	2nd IF Trans.	#1790-Q						
L5	3rd IF Trans.	#1790-R						

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA						NOTES
	PRI.	SEC.	MACO PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	.65	1	ST-5						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	MACO PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	620Ω CT	10Ω	ST-6							

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	MACO PART No.	QUAM PART No.	
SP1	2½"	PM	10-12Ω	P-21IS	25A07Z10.8	

BATTERIES

ITEM No.	VOLTAGE	MACO PART No.	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
			"A"	"B"	"A"	"B"	"A"	"B"	
M1	1.5V			Z *		1015 *		M-15R *	* 4 Required

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		MACO PART No.	CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M2		OA70	1N60	1N60	1N60	Detector & AVC (Pigtail)
M3		MA23A				Output Bias

MISCELLANEOUS

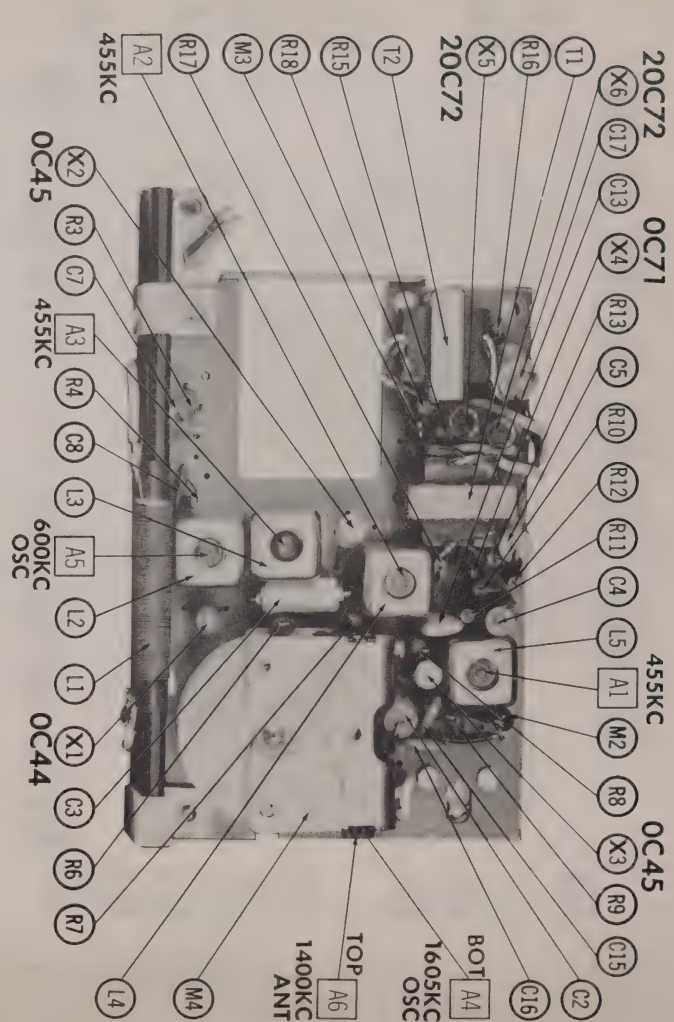
ITEM No.	PART NAME	MACO PART No.	NOTES
M4	Tuning Cap.	2XC-17B16	2 Gang
	Earphone	EP-C-1	

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	EB-165 Knob T	Tuning
Knob	EB-165 Knob V	Volume
Cabinet	EB-165	Specify Color

CHASSIS—TOP VIEW



PHOTOFACT® Folder with CIRCUITRACE®

MINUTE MAN MODEL 6T-170

MINUTE MAN
MODEL 6T-170

MINUTE MAN
MODEL 6T-170

TRADE NAME	Minute Man Model 6T-170
IMPORTER	Intercontinental Industries, Inc., 555 W. Adams Street, Chicago 6, Illinois
TYPE SET	Battery Operated Transistorized Portable AM Receiver
POWER SUPPLY	9 Volts DC
RATING	5MA @ 9 Volts DC (No Signal, Min. Volume) 10MA @ 9 Volts DC (Signal, Normal Volume)
TUNING RANGE	BROADCAST 530-1650KC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools: A1, A2, A3, A4 ..... GENERAL CEMENT #8282, 8606, 8606-L, 9091
WALSCO #2526, 2541, 2542, 2543, 2544
A5, A6 ..... GENERAL CEMENT #5000, 5003, 5066, 8276, 8290, 9087, 9089
WALSCO #2512, 2525, 2528

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	Loop	455KC (400~ Mod.)	Tuning gang fully closed	Across voice coil	A1, A2, A3	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
2.	"	530KC	"	"	A4	"
3.	"	1650KC	Tuning gang fully open	"	A5	"
4.	"	1400KC	Tune to 1400KC signal	"	A6	Adjust for maximum output while rocking tuning gang. Repeat steps 2, 3 and 4.

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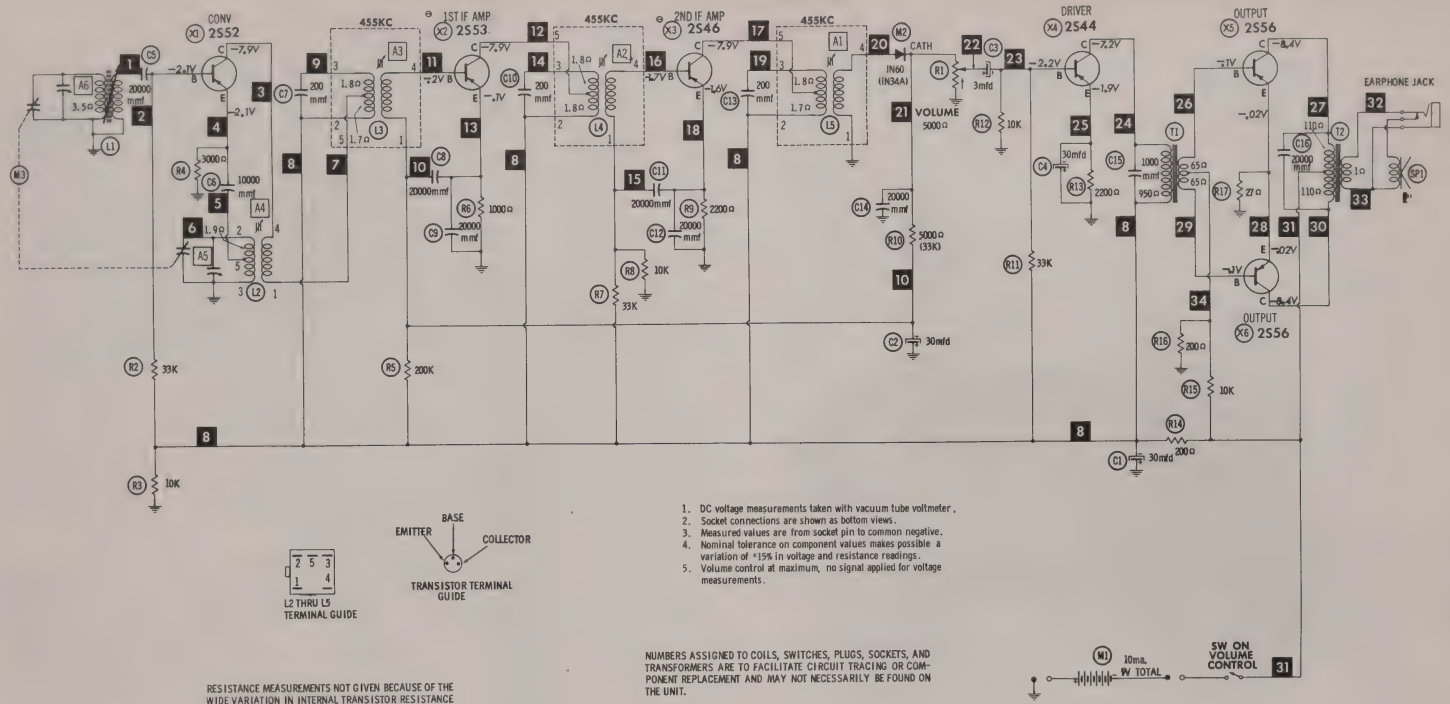
SET 485 FOLDER 14



1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

RESISTANCE MEASUREMENTS NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

A PHOTOFACT STANDARD NOTATION SCHEMATIC
with CIRCUITRACE®

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MINUTE MAN
MODEL 6T-170

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA				NOTES
			CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2S52	Converter		2N412	2N486	2N412	PNP
X2	2S53 *	1st IF Amplifier		2N410	2N483	2N410	PNP
X3	2S49 *	2nd IF Amplifier		2N410	2N483	2N410	PNP
X4	2S44	Driver		2N406	2N362		PNP
X5	2S56	Output		2N408	2N632	2N408	PNP
X6	2S56	Output		2N408	2N632	2N408	PNP

* Alternate Type 2S45.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	Minute Man PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1	30	10		XPP10030	NLW25-10				
C2	30	6		XPP6030	NLW30-6		ML30-6	TE-1092	
C3	3	6		XPP6003	NLW3-6	TT6X3	ML4-6	TE-1082	
C4	30	6		XPP6030	NLW30-6		ML30-6	TE-1092	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA						
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.	
C5	20000		C80V203AM	DDM-203	H-05S2		TA-120	TG-S20	
C6	10000		C80V103AM	DDM-103	H-05S1		TA-110	TG-S10	
C7	200		NPO-SI 200	TCZ-200	L10T2	CCD-201	CNO-320	10TCC-T20	
C8	20000		C80V203AM	DDM-203	H-05S2		TA-120	TG-S20	
C9	20000		C80V203AM	DDM-203	H-05S2		TA-120	TG-S20	
C10	200		NPO-SI 200	TCZ-200	L10T2	CCD-201	CNO-320	10TCC-T20	
C11	20000		C80V203AM	DDM-203	H-05S2		TA-120	TG-S20	
C12	20000		C80V203AM	DDM-203	H-05S2		TA-120	TG-S20	
C13	200		NPO-SI 200	TCZ-200	L10T2	CCD-201	CNO-320	10TCC-T20	
C14	20000		C80V203AM	DDM-203	H-05S2		TA-120	TG-S20	
C15	1000		C80V102AM	DM-102	H-05D1	CCD-102	GO210	10TS-D10	
C16	20000		C80V203AM	DDM-203	H-05S2		TA-120	TG-S20	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Minute Man PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1	5000Ω	1/4						Volume & Switch

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R2	33K	
R3	10K	
R4	3000Ω	
R5	200K	
R6	1000Ω	
R7	33K	

ITEM No.	RATING	REMARKS
R8	10K	
R9	2200Ω	
R10	5000Ω	(33K) *
R11	33K	
R12	10K	
R13	2200Ω	

ITEM No.	RATING	REMARKS
R14	200Ω	
R15	10K	
R16	200Ω	
R17	27Ω	

* Alternate value.

PRINTED BOARD

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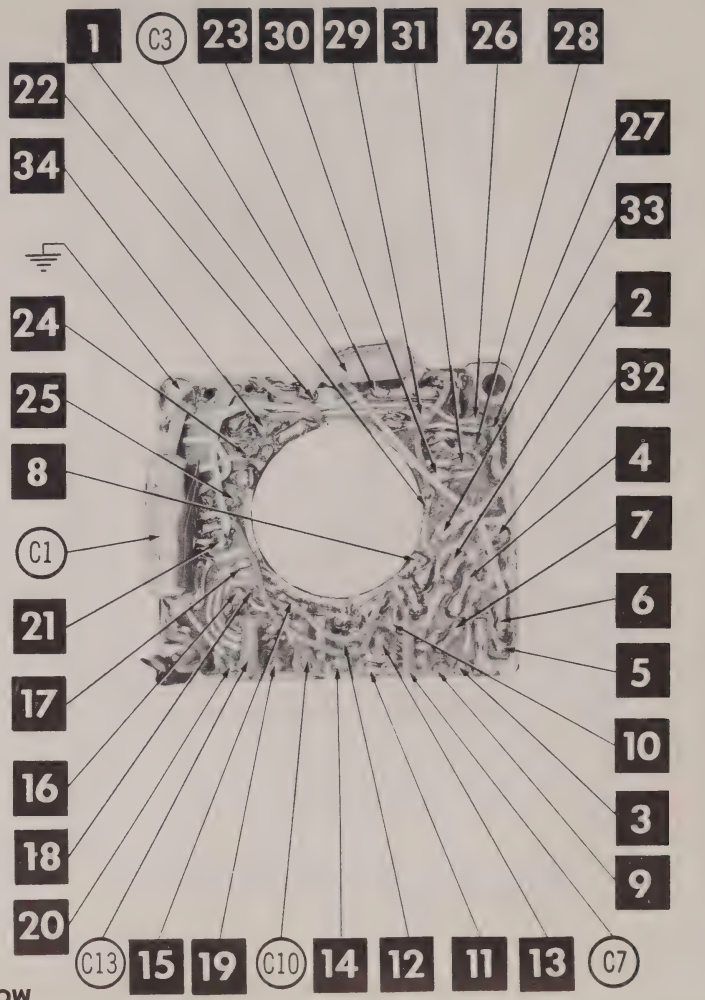


MINUTE MAN
MODEL 61-170

FOLDER 14

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		Minute Man PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Loopstick							
L2	Osc. Coil							
L3	1st IF Trans.							
L4	2nd IF Trans.							
L5	3rd IF Trans.							

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA						NOTES
	PRI.	SEC.	Minute Man PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2:	1							

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	Minute Man PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	550Ω	6-8Ω	T-22							

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	Minute Man PART No.	QUAM PART No.	
SP1	2"	PM	6-8Ω	6097		

BATTERIES

ITEM No.	VOLTAGE	Minute Man PART No.	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
			"A"	"B"	"A"	"B"	"A"	"B"	
M1	9V	BL-006P		2U6		216		M1604	

CRYSTAL DIODES

ITEM No.	ORIG TYPE	REPLACEMENT DATA				NOTES
		Minute Man PART No.	CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M2	1N60 *		1N60	1N60	1N60	Detector (Pigtail) * Alternate Type 1N34A

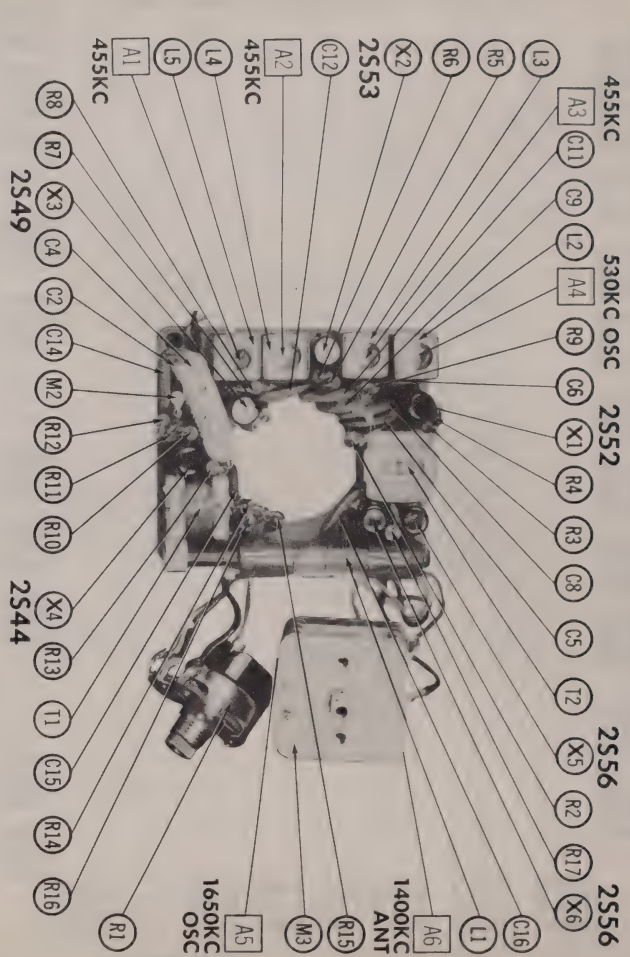
MISCELLANEOUS

ITEM No.	PART NAME	Minute Man PART No.	NOTES
M3	Tuning Cap.		2 Gang

WIRING DATA

General-use Unshielded Hook-up Wire .....Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

CHASSIS—TOP VIEW



PHOTOFACT® Folder with CIRCUITRACE®

SILVERTONE MODELS 65, 66, 67
(Ch. 528.53550, 528.59430)

SILVERTONE MODELS 65, 66, 67
(Ch. 528.53550. 528.59430)

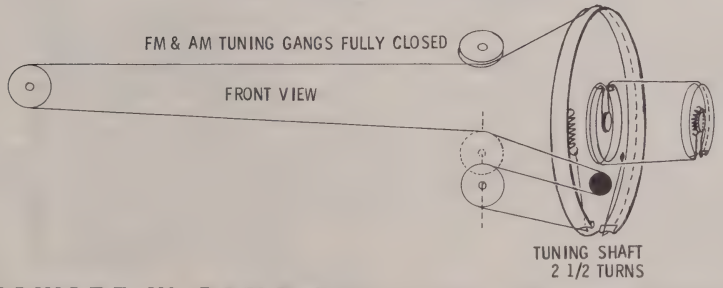
MODEL 65

SILVERTONE MODELS 65, 66, 67
(Ch. 528.53550, 528.59430)

TRADE NAME	Silvertone Models 65, 66, 67 (Tuner Ch. 528.53550, Amp. Ch. 528.59430)		
SUPPLIER	Sears, Roebuck & Co., 925 S. Homan Ave., Chicago, Illinois		
TYPE SET	AC Operated 6 Tube FM-AM Tuner, 7 Tube Stereo Amplifier and 4 Speed Automatic Record Changer		
POWER SUPPLY	110-120 Volts AC, 60 Cycles	RATING	120 Watts, 1.14 Amp. @ 117 Volts AC (FM)
TUNING RANGE	BROADCAST 532 - 1630KC	FREQ. MOD.	88 - 108MC

FOR SERVICE INFORMATION ON RECORD CHANGER 528.56760 OR 528.56761 - SEE SIMILAR SILVERTONE 528.56310 - PHOTOFACT SET 417 FOLDER 10

DIAL CORD STRINGING



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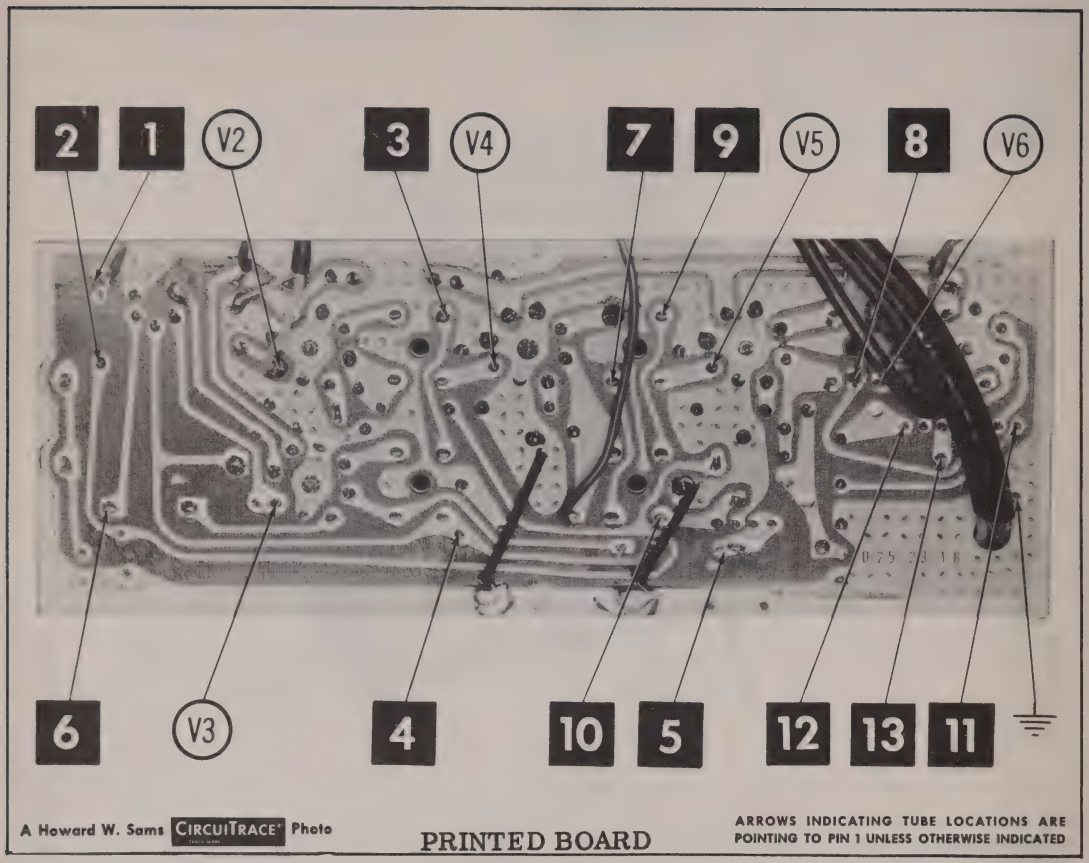
JN747

SET 485 FOLDER 15



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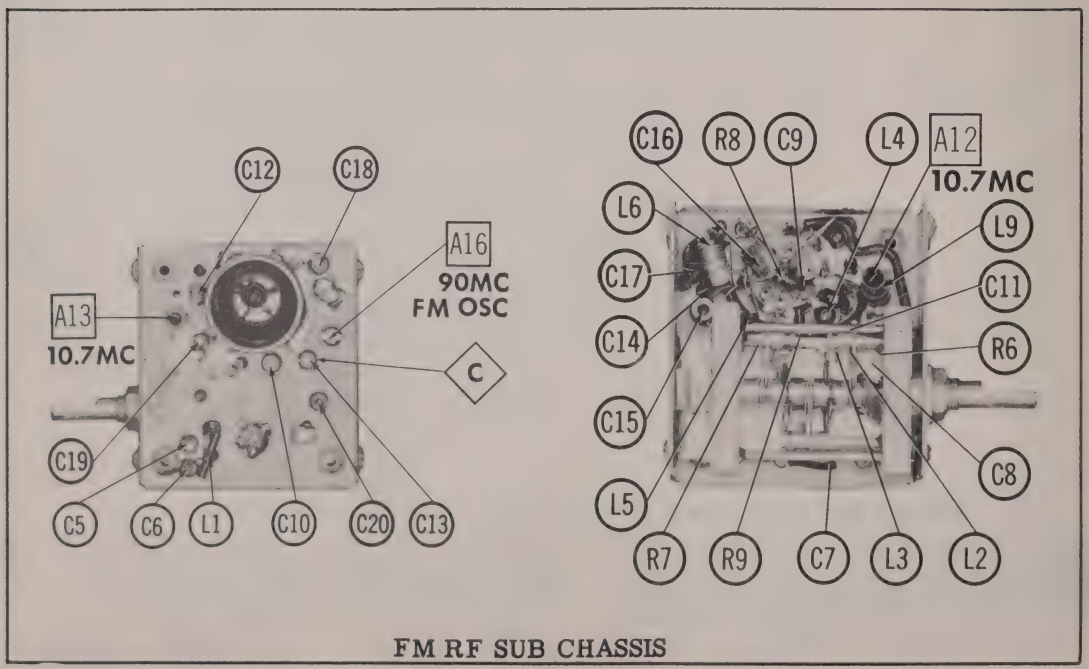
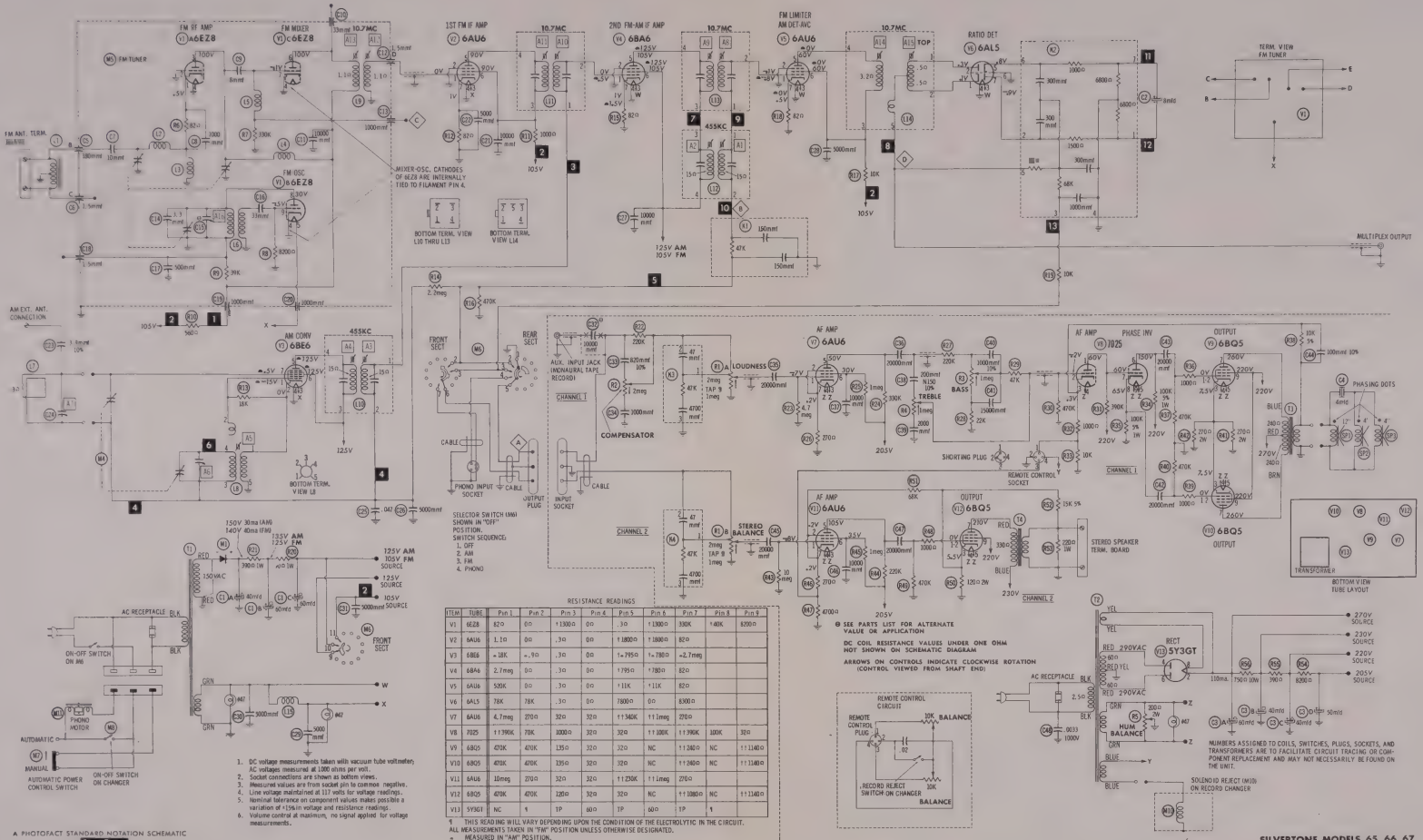
ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED



FM RF SUB CHASSIS



SELECTOR SWITCH (M6) SHOWN IN "OFF" POSITION. SWITCH SEQUENCE: 1. OFF 2. AM 3. FM 4. PHONO

1. DC voltage measurements taken with vacuum tube voltmeter, AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6EZ8	82Ω	0Ω	↑1300Ω	0Ω	.3Ω	↑1300Ω	330K	↑40K	8200Ω
V2	6AU6	1.1Ω	0Ω	.3Ω	0Ω	↑1800Ω	↑1800Ω	82Ω		
V3	6BE6	∞18K	∞.9Ω	.3Ω	0Ω	↑∞795Ω	↑∞780Ω	∞2.7meg		
V4	6BA6	2.7meg	0Ω	.3Ω	0Ω	↑795Ω	↑780Ω	82Ω		
V5	6AU6	520K	0Ω	.3Ω	0Ω	↑11K	↑11K	82Ω		
V6	6AL5	78K	78K	.3Ω	0Ω	7800Ω	0Ω	8300Ω		
V7	6AU6	4.7meg	270Ω	32Ω	32Ω	↑↑340K	↑↑1meg	270Ω		
V8	7025	↑↑390K	70K	1000Ω	32Ω	32Ω	↑↑100K	↑↑390K	100K	32Ω
V9	6BQ5	470K	470K	135Ω	32Ω	32Ω	NC	↑↑240Ω	NC	↑↑1140Ω
V10	6BQ5	470K	470K	135Ω	32Ω	32Ω	NC	↑↑240Ω	NC	↑↑1140Ω
V11	6AU6	10meg	270Ω	32Ω	32Ω	↑↑250K	↑↑1meg	270Ω		
V12	6BQ5	470K	470K	125Ω	32Ω	32Ω	NC	↑↑1080Ω	NC	↑↑1140Ω
V13	5Y3GT	NC	¶	TP	60Ω	TP	60Ω	TP	¶	

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT. ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE DESIGNATED.
- MEASURED IN "AM" POSITION.
† MEASURED FROM OUTPUT OF M1.
†† MEASURED FROM PIN 2 OF V13.
NC NO CONNECTION
TP TIE POINT

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE

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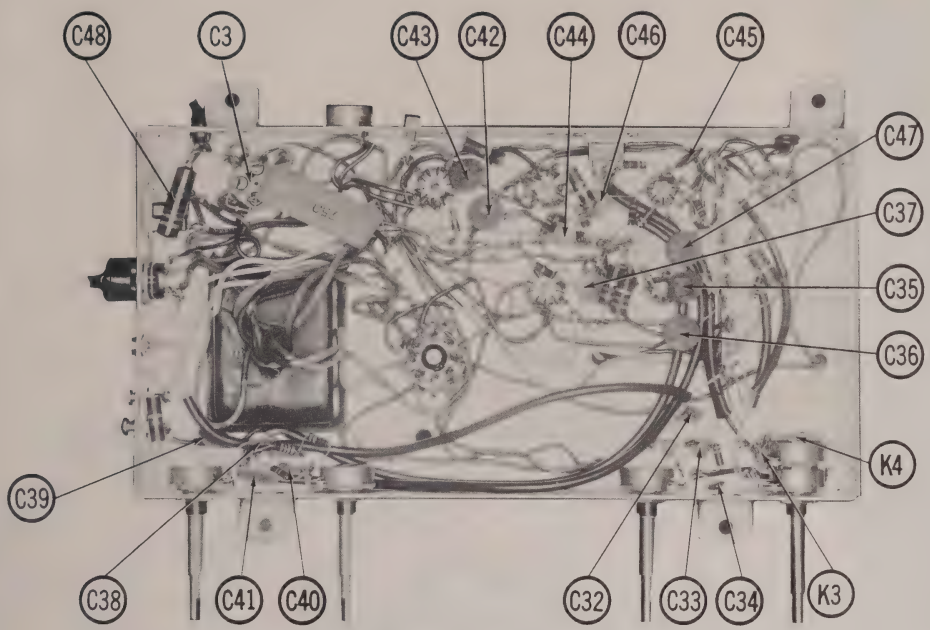
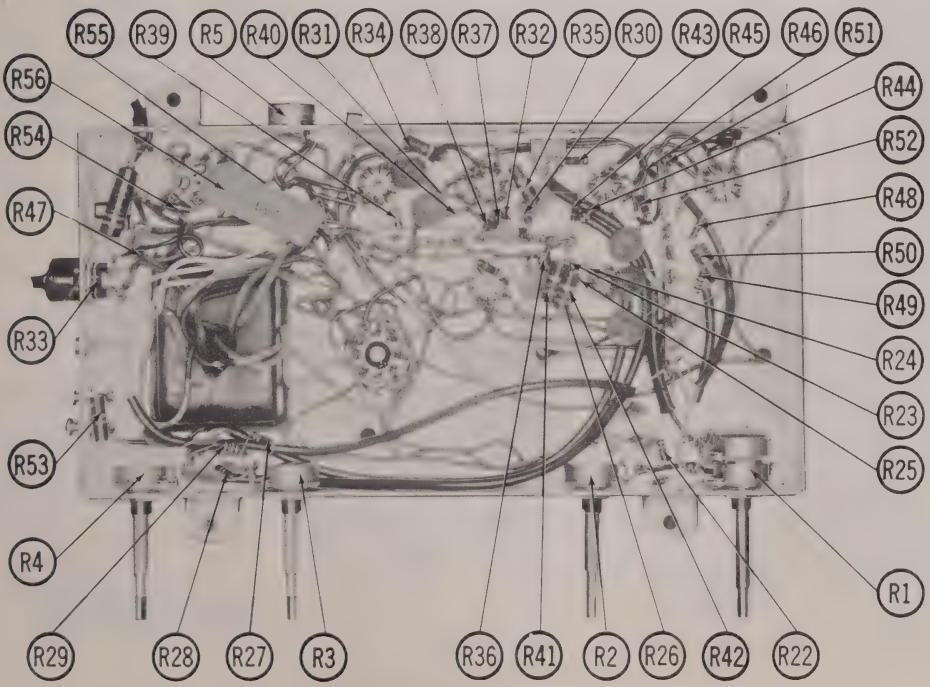
SILVERTONE MODELS 65, 66, 67 (Ch. 528.53550, 528.59430)



AMP CHASSIS - BOTTOM VIEW



AMP CHASSIS - BOTTOM VIEW

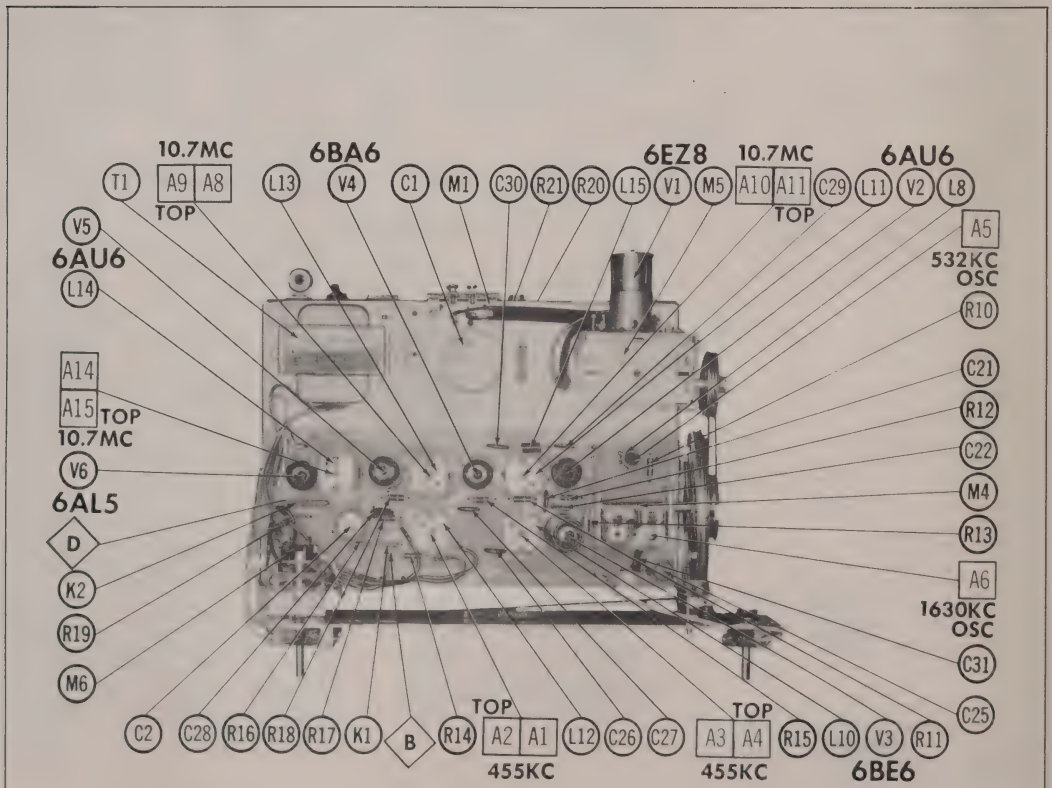
AM ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.
Set Treble control fully counterclockwise. Set Bass control fully clockwise.
Suggested Alignment Tools: A1 thru A4, A8 thru A11, A14, A15.. GENERAL CEMENT #5097, 8727
WALSCO #2515
A5 ..... GENERAL CEMENT #8282, 8606, 8606L, 9295
WALSCO #2526, 2543, 2544, 2545
A6, A7, A16 ..... GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520
A12, A13 ..... GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8987
WALSCO #2531

AM ALIGNMENT - SELECTOR IN AM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1.	High side thru .1mfd to pin 7 (grid) of AM Converter. Low side to chassis.	455KC (400~ Mod.)	AM Tuning gang fully open	AC probe to point (A). Common to chassis.	A1, A2, A3, A4	Adjust for maximum deflection.
2.	Loop	532KC	Tuning gang fully closed	"	A5	"
3.	"	1630KC	Tuning gang fully open	"	A6	Adjust for maximum deflection. Repeat steps 2 and 3.
4.	"	1400KC	Tune to 1400KC signal	"	A7	Adjust for maximum deflection.



TUNER CHASSIS—TOP VIEW

FM ALIGNMENT INSTRUCTIONS

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM - SELECTOR IN FM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
5.	High side thru . 01mfd to pin 1 (grid) of 1st FM IF. Low side to chassis.	10.7MC (Unmod.)	FM Point of non-interference	DC probe to point Ⓑ. Common to chassis.	A8, A9, A10, A11,	Adjust for maximum deflection.
6.	High side thru . 01mfd to point Ⓒ. Low side to chassis.	"	"	"	A12, A13	"
7.	"	"	"	DC probe to point Ⓓ. Common to chassis.	A14	"
8.	"	"	"	DC probe to point Ⓐ. Common to chassis.	A15	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE - SELECTOR IN FM POSITION

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT -SCOPE	ADJUST	REMARKS
5.	High side thru . 01mfd to pin 1 (grid) of 1st FM IF. Low side to chassis.	10.7MC (450KC swp)	FM Point of non-interference	Vert. Amp. to point Ⓑ. Low side to chassis.	A8, A9, A10, All	Adjust for maximum gain and symmetry of response similar to Fig. 1.
6.	High side thru . 01mfd to point Ⓒ. Low side to chassis.	"	"	"	A12, A13	"
7.	"	"	"	Vert. Amp. to point Ⓓ. Low side to chassis.	A14	"
8.	"	"	"	Vert. Amp. to point Ⓐ. Low side to chassis.	A15	Adjust to place marker at the center of of crossover lines similar to Fig. 2. SLIGHTLY retouch A14 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT - SELECTOR IN FM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
9.	Across FM antenna with 120Ω in each lead.	90MC	FM 90MC	DC probe to point Ⓑ. Common to chassis.	A16	Adjust for maximum deflection.

FIG. 1

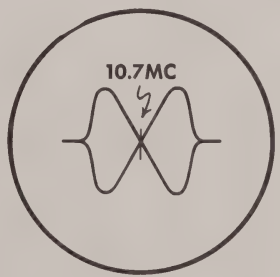


FIG. 2

PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆					
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	FM RF Amp. - FM Mixer - FM Osc.	6EZ8	V7	Channel 1 AF Amp.	6AU6
V2	1st FM IF Amplifier	6AU6	V8	Channel 1 AF Amp. - Phase Inverter	7025
V3	AM Converter	6BE6	V9	Channel 1 Output	6BQ5
V4	2nd FM - AM IF Amp.	6BA6	V10	Channel 1 Output	6BQ5
V5	FM Limiter - AM Det. - AVC	6AU6	V11	Channel 2 AF Amp.	6AU6
V6	Ratio Detector	6AL5	V12	Channel 2 Output	6BQ5
			V13	Rectifier	5Y3GT

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA SILVERTONE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▲40	150	18-57-3	AFH3-11-40	XC0123	FP330.9	TMQ-136	TVL-3443.2	
B	■60	150		MW-4					
C	▬60	150							
C2	8	50	18-98-5	BCD-50008	BBR8-150	TC41	TD-8-150	TVA-1405	
C3A	▬60	400	18-56-3		C0350	FP377		TVL-4739.4	
B	■40	400			BR6045	TC795		TVA-1713	
C	▲40	350							
D	50	300							
C4	4	150NP	18-9-5	NP-PRS7750	BBR8-150 †	TCN510		TVAS-1402.1*	

† Use 2 units. Connect negative terminals together.
Connect positive terminals into circuit the same as the original non-polarized unit.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C5	180	#277-181						
C6	1.5	#274-159						
C7	10		DI-10	DD-100	L10Q1	CCD-100	GP410	10TS-Q10
C8	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C9	8		NPO-DI 8.2	DD-080	C10V8C			10TCC-V82
C10	33	#275-330						
C11	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C12	1.5	#274-159						
C13	1000		EF-001	MFT-1000		CCF-102	CT280A	
C14	3.3		NPO-DI 3.3	DTZ-3R3	C10V33C	CCTO-3R3	CNO-533	10TCC-V33
C15		Note 1						
C16	33		NPO-DI 33	DTZ-33	C10Q33C	CCTO-330	CNO-433	10TCC-Q33
C17	500		1469-0005	DD-501	BYA10T5	CCD-501	GP350	10TS-T50
C18	1.5							

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C19	1000		EF-001	MFT-1000		CCF-102	CT280A	
C20	1000		EF-001	MFT-1000		CCF-102	CT280A	
C21	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C22	5000		BPD-005	DD-502	BYA10D5	CCD-502	GP250	5HK-D50
C23	3.9 10%	(4.7) ◆ #19-180-0			C10V4C			10TCC-V39
C24								
C25	.047 200V		P2151N-047	DD-503	BC2S47J	4DP-3-473	ACE6147	2SE-S47
C26	5000		BPD-005	DD-502	BYA10D5	CCD-502	GP250	5HK-D50
C27	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C28	5000		BPD-005	DD-502	BYA10D5	CCD-502	GP250	5HK-D50
C29	5000		BPD-005	DD-502	BYA10D5	CCD-502	GP250	5HK-D50
C30	5000		BPD-005	DD-502	BYA10D5	CCD-502	GP250	5HK-D50
C31	5000		BPD-005	DD-502	BYA10D5	CCD-502	GP250	5HK-D50
C32	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C33	820 10%		DI-820	DD-821	1R5T82	CCD-821	GP382	10TS-T82
C34	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C35	20000		BPD-02	DD-203	BYB6S2	CCD-203	GP120	5HK-S20
C36	20000		BPD-02	DD-203	BYB6S2	CCD-203	GP120	5HK-S20
C37	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C38	200 N150 10%	#15-20111				*		
C39	2000		BPD-002	DD-202	BYA10D2	CCD-202	GP220	5HK-D20
C40	1000 10%		DI-1000	DD-102	PM6D1	CCD-102	GP210	10TS-D10
C41	15000		BPD-015	DD-153	BYA10S15	CCD-153	GP115	5HK-D15
C42	20000		BPD-02	DD-203	BYB6S2	CCD-203	GP120	5HK-D20
C43	20000		BPD-02	DD-203	BYB6S2	CCD-203	GP120	5HK-D20
C44	100 10%		DI-100	DD-101	L10T1	CCD-101	GP310	10TS-T1
C45	20000		BPD-02	DD-203	BYB6S2	CCD-203	GP120	5HK-S20
C46	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C47	20000		BPD-02	DD-203	BYB6S2	CCD-203	GP120	5HK-S20
C48	.0033 1000V		P1088N-0033	DD-332	CUB16D33	16DP-2-332	GEM-16233	MB-D33

Silvertone Part Number ◆ Alternate Value
Note 1. Included with FM Tuning Gang

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA SILVERTONE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	2meg	½	24-353-0					Loudness, Channel 1
B	1meg tap	½						Stereo Balance, Channel 2
R2A	2meg	½	24-9-3	AB-75	A47-2meg-S	Q11-139	U56	Compensator
B	Shaft			AK-8	RS-3/16	NQ	DS-37	
R3A	1meg	½	24-05A	AB-69	A47-1meg-S	Q11-137	U54	Bass
B	Shaft			AK-8	RS-3/16	NQ	DS-37	
R4A	1meg	½	24-199-2	AK-69	A47-254L	Q11-137	U54	Treble
B	Shaft			AK-8	RS-3/16	NQ	DS-37	
R5	200Ω	2(WW)	24-1-3				FL200P	Hum Balance

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R6	82Ω	
R7	330K	
R8	8200Ω	
R9	39K	
R10	560Ω	
R11	1000Ω	
R12	82Ω	
R13	18K	
R14	2.2meg	
R15	82Ω	
R16	470K	
R17	10K	
R18	82Ω	
R19	10K	
R20	390Ω 1W	
R21	390Ω 1W	
R22	220K	

ITEM No.	RATING	REMARKS
R23	4.7meg	
R24	330K	
R25	1meg	
R26	270Ω	
R27	220K	
R28	22K	
R29	47K	
R30	470K	
R31	390K	
R32	1000Ω	
R33	10K	
R34	100K 5% 1W	
R35	100K 5% 1W	
R36	1000Ω	
R37	470K	
R38	10K 5%	
R39	1000Ω	

ITEM No.	RATING	REMARKS
R40	470K	
R41	270Ω 2W	
R42	270Ω 2W	
R43	10meg	
R44	220K	
R45	1meg	
R46	270Ω	
R47	4700Ω	
R48	1000Ω	
R49	470K	
R50	120Ω 2W	
R51	68K	
R52	15K 5%	
R53	220Ω 1W	
R54	8200Ω	
R55	390Ω	
R56	750Ω 10W	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	SILVERTONE PART No.	REPLACEMENT DATA
K1	AM Det. RF Filter	150mmf, 150mmf, 47K	13-2-2	Aerovox PA-98 Centralab PC-51 Cornell-Dubilier 11TM2 Sprague D-2
K2	Ratio Detector Network	(3) 300mmf, 1000mmf, 68Ω, 1000Ω, 1500Ω, (2) 6800Ω, 68K	13-35-3	Aerovox PA-694 Centralab PC-342
K3	Loudness Compensator	47mmf, 4700mmf, 47K	13-36-3	
K4	Loudness Compensator	47mmf, 4700mmf, 47K	13-36-3	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA: SILVERTONE PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	FM Ant. Trans.	3197						
L2	RF Choke	3192-8						
L3	Cathode Choke	300-2						
L4	RF Choke	301-11						
L5	RF Choke	3190-24						
L6	FM Osc. Coil	3197						
L7	Loop Antenna	84-7786						
L8	AM Osc. Coil	10-55-4						

COILS (cont)

ITEM No.	USE	REPLACEMENT DATA: SILVERTONE PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L9	1st FM IF Trans.	3193						
L10	1st AM IF Trans.	10-116-2	16-6780	16-6780	BC-356	13-PC1	RF-4	
L11	2nd FM IF Trans.	10-117-2	16-3490	16-3490		1463-PC		
L12	2nd AM IF Trans.	10-116-2	16-6780	16-6780	BC-357	13-PC2	RF-4	
L13	3rd FM IF Trans.	10-118-2	16-3490	16-3490		1463-PC		
L14	Ratio Detector	10-29-0	17-3492	17-3492		1465-PC		
L15	Fil. Choke	10-28-0						

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA: SILVERTONE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
	PRI.	SEC. 1	SEC. 2							
T1	117V @ .3A	150V @ .040A	6.3V @ 2.1A	80-36-0						
	PRI.	SEC. 1	SEC. 2							
T2	117V @ .84A	580VCT @ .110A	5V @ 2A	80-33-0						
	SEC. 3	SEC. 4	SEC. 5							
	24V @ .2A	6.3V @ 3.4A								

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA: SILVERTONE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T3	6400Ω CT	6-8Ω	80-106-1	24S43	A-2905	AU-609 ①	A-3880	24S43	S-55X	① Drill new mounting hole.
T4	5200Ω CT	6-8Ω	80-98-1	24S17	A-2904	AU-600	A-3823	24S17	S-55Z	

SPEAKER

ITEM No.	TYPE: SIZE	FIELD	V. C. IMP.	REPLACEMENT DATA: SILVERTONE PART No.	QUAM PART No.	NOTES
SP1	12"	PM	6-8Ω	33-419-4	12A1Z7.4	
SP2	4"	PM	12-14Ω	33-417-4	4A07Z13.5	
SP3	4"	PM	12-14Ω	33-417-4	4A07Z13.5	

PARTS LIST AND DESCRIPTIONS (Continued)

RECTIFIERS

ITEM No.	RATING CURRENT (Measured)	REPLACEMENT DATA SILVERTONE PART No.	INTERNATIONAL PART No.	ITT PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M1	.040A * .030A ♦	86-21-3 †	RS065 †	1234AH †	65 †	SR200 ǂ	

* Measured in "FM" position.
♦ Measured in "AM" position.

† Selenium Type
ǂ Silicon Type

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA SILVERTONE PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	ELECTRO-VOICE PART No. CARTRIDGE	ELECTRO-VOICE PART No. NEEDLE	JENSEN PART No. CARTRIDGE	JENSEN PART No. NEEDLE	SONOTONE PART No. CARTRIDGE	SONOTONE PART No. NEEDLE
M2	33-314-0	13-TBX		26DS				8TA4-SD	N-8TA-SD

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA SILVERTONE PART No.	CLEVITE WALCO PART No.	JENSEN PART No.	REMARKS
M3	83-1308 † ♦	W-103STS † or W-103STDS † ♦	S-69X † or S-69XSD † ♦ or S-69XDD ♦	† Jewel ♦ Diamond

MISCELLANEOUS

ITEM No.	PART NAME	SILVERTONE PART No.	NOTES
M4	Tuning Cap.	19-84-2	AM, 2 Gang
M5	FM Tuner	95-201-0	Complete, Includes Tuning Capacitor (Part #899)
M6	Switch	69-292-0	Off-On, Selector
M7	Switch	69-269-0	Automatic Power Control
M8	Switch	84-7859	Off-On (Part of Changer)
M9	Switch	69-282-0	Stereo-Monaural (Part of Changer)
M10	Solenoid	27-74-2	Reject (Part of Changer)
M11	Motor	59-72	Phono Drive (Part of Changer), Ch. 528.53760
	Motor	59-89	Phono Drive (Part of Changer), Ch. 528.56761
	Printed Board	84-7335-0	Less Tubes

CABINETS & CABINET PARTS

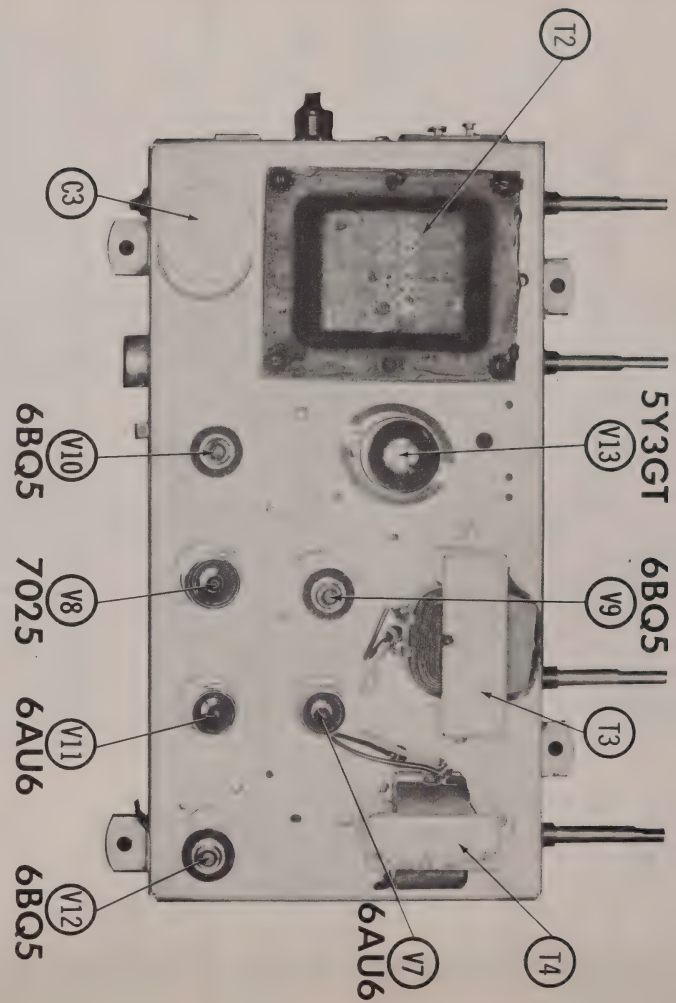
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	52-1274-0	Tuning, Treble, Bass, Compensator, Selector
Knob	52-1267	Loudness
Knob	52-1241	Stereo Balance
Window	48-172-1	Dial Scale
Dial Pointer	52-216-1	
Cabinet	42-116-3	Model 65
Cabinet	42-117-3	Model 66
Cabinet	42-118-3	Model 67
Cabinet Lid	21-527-0	Model 65
Cabinet Lid	21-528-0	Model 66
Cabinet Lid	21-529-0	Model 67
Cabinet Leg	49-492	Model 65
Cabinet Leg	49-493	Model 66
Cabinet Leg	49-494	Model 67

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

AMP CHASSIS—TOP VIEW



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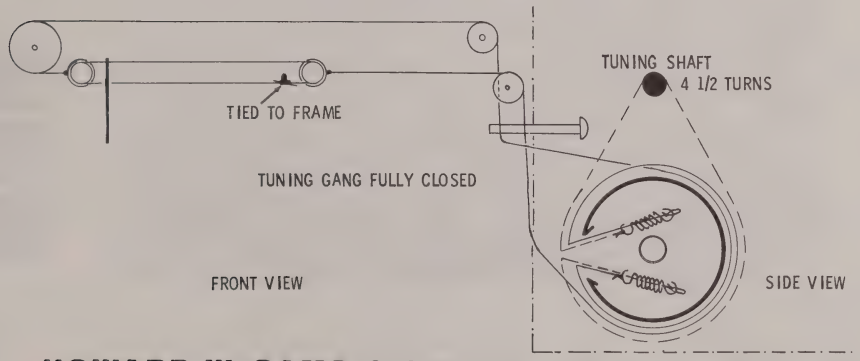
**SILVERTONE MODEL
222 (Ch. 528.53680)**

SILVERTONE MODEL
222 (Ch. 528.53680)

SILVERTONE MODEL
222 (Ch. 528.53680)

TRADE NAME	Silvertone Model 222 (Ch. 528.53680)		
SUPPLIER	Sears, Roebuck & Co., 925 S. Homan Ave., Chicago, Illinois		
TYPE SET	Battery Operated Transistorized Portable 4-Band Receiver		
POWER SUPPLY	12 Volts DC	RATING	15MA@12 Volts DC (No Signal, Min. Volume) 20MA@12 Volts DC (Signal, Normal Volume)
TUNING RANGE	Band 1: 190 - 410KC Band 2: 532 - 1610KC		Band 3: 1.9 - 6.5MC Band 4: 6.3 - 21MC

DIAL CORD STRINGING



HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of JF926

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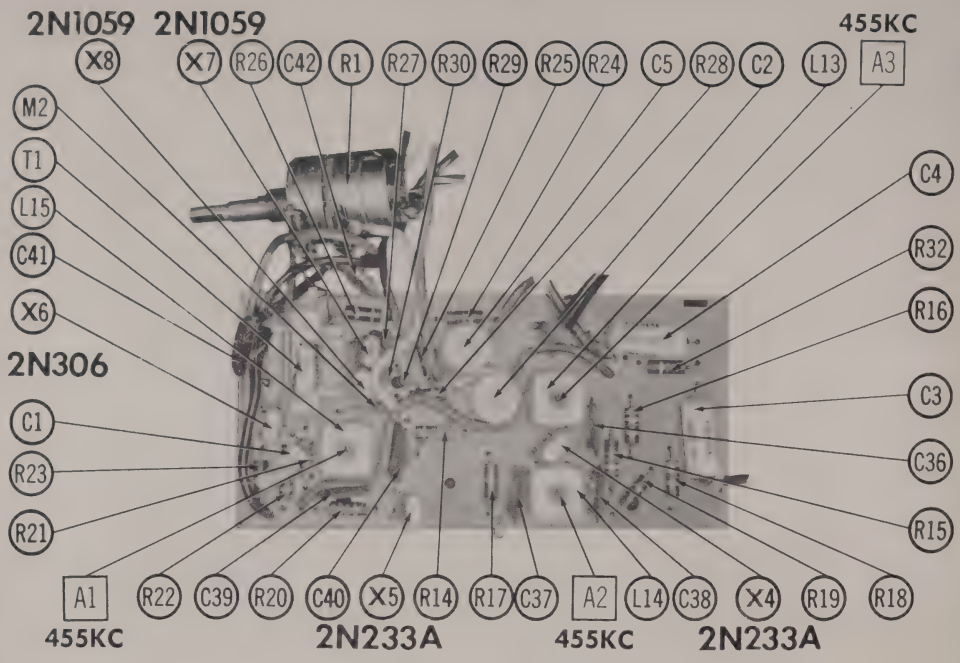
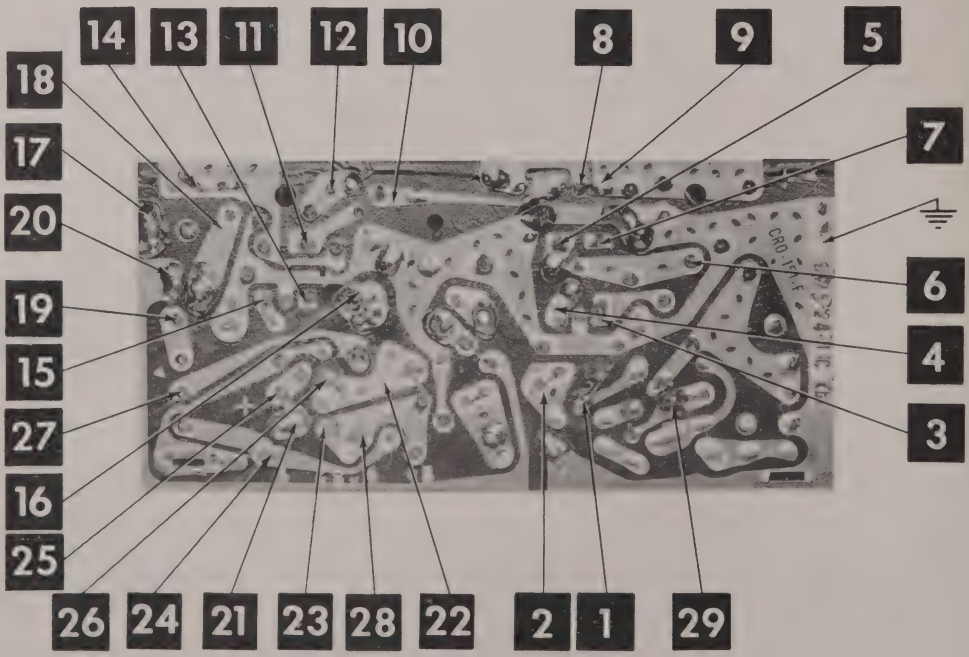
SET 485 FOLDER 16

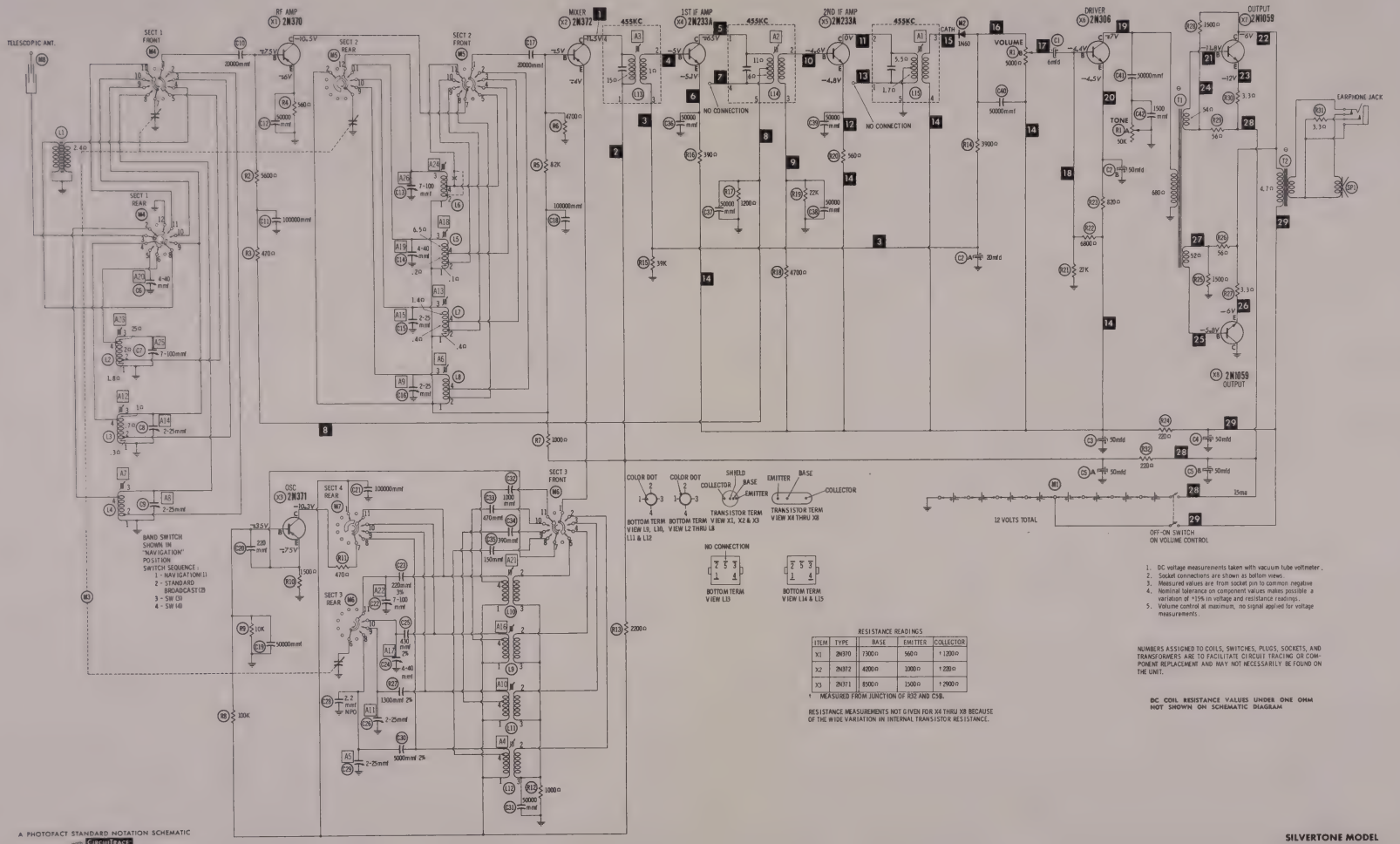


PRINTED BOARD—TOP VIEW



A Howard W. Sams CIRCUITRACE Photo

PRINTED BOARD



RESISTANCE READINGS

ITEM	TYPE	BASE	EMITTER	COLLECTOR
X1	2N370	7300Ω	560Ω	†1200Ω
X2	2N372	4200Ω	1000Ω	†220Ω
X3	2N371	8500Ω	1500Ω	†2900Ω

† MEASURED FROM JUNCTION OF R32 AND C58.

RESISTANCE MEASUREMENTS NOT GIVEN FOR X4 THRU X8 BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE

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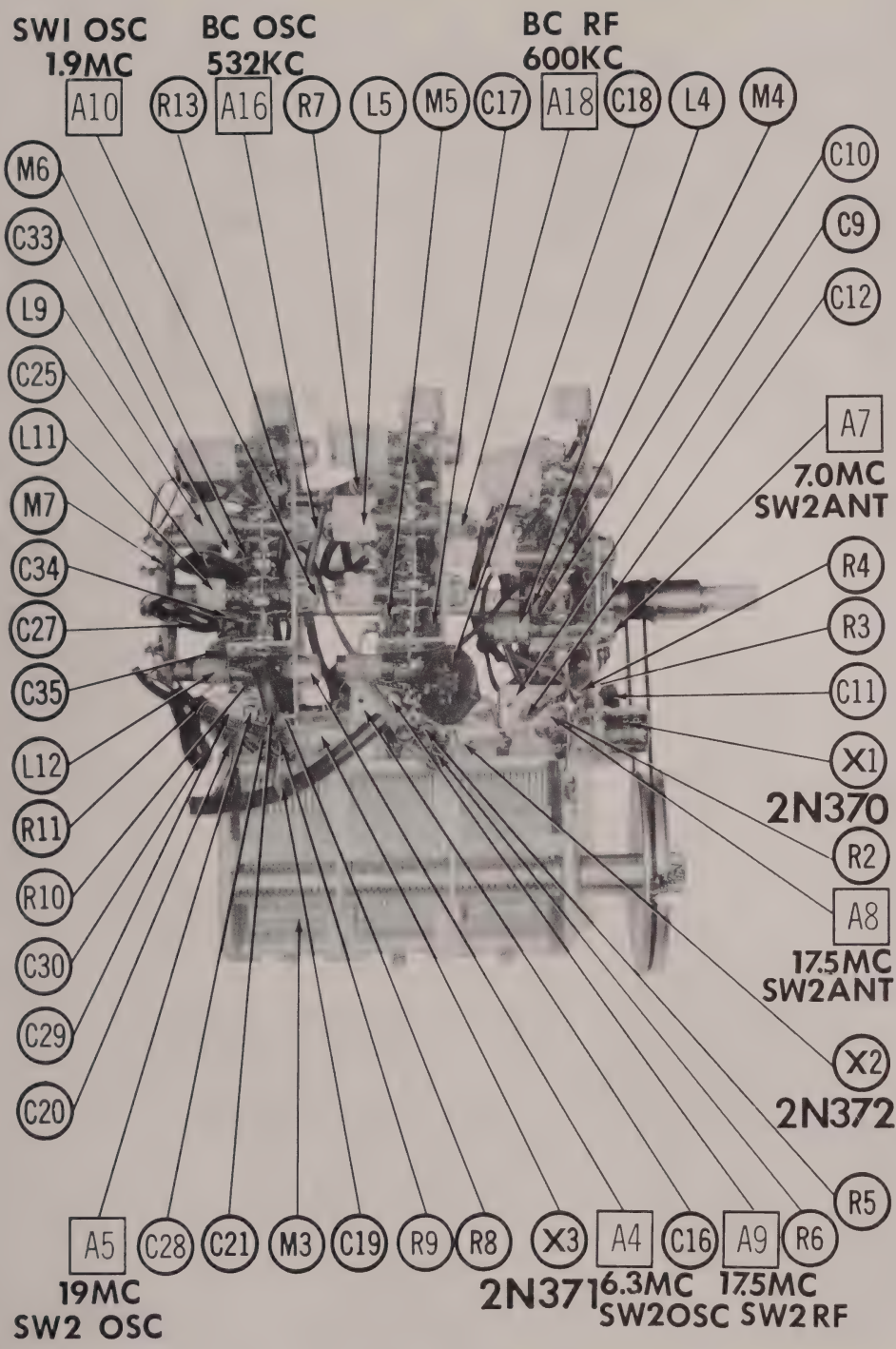
SILVERTONE MODEL 222 (Ch. 528.53680)



TUNER—SIDE VIEW

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.
Suggested alignment tools: A1, A2, A3..... GENERAL CEMENT #9440
A4 thru A26..... GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8729, 8987, 8988, 8989
WALSCO #2531, 2532

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	High side thru .1mfd to RF stator lug of Tuning gang. (Center section). Low side to chassis.	455KC (400% Mod.)	#2	Tuning gang fully open.	Across voice coil.	A1, A2, A3	Adjust for maximum output.
2.	High side thru 15mmf to antenna. Low side to chassis.	6.3MC	#4	Tuning gang fully closed.	"	A4	"
3.	"	19MC	"	19MC	"	A5	Adjust for maximum output. Repeat Steps 2 and 3.
4.	"	7MC	"	7MC	"	A6, A7	Adjust for maximum output.
5.	"	17.5MC	"	17.5MC	"	A8, A9	Adjust for maximum output. Repeat Steps 4 and 5.
6.	"	1.9MC	#3	Tuning gang fully closed.	"	A10	Adjust for maximum output.
7.	"	6.0MC	"	6.0MC	"	A11	Adjust for maximum output. Repeat Steps 6 and 7.
8.	"	2.2MC	"	2.2MC	"	A12, A13	Adjust for maximum output.
9.	"	5.6MC	"	5.6MC	"	A14, A15	Adjust for maximum output. Repeat Steps 8 and 9.
10.	Loop	532KC	#2	Tuning gang fully closed.	"	A16	Fashion loop of several turns of wire and radiate signal into loop of receiver Adjust for maximum output.
11.	"	1600KC	"	1600KC	"	A17	Adjust for maximum output. Repeat Steps 10 and 11.
12.	"	600KC	"	600KC	"	A18	Adjust for maximum output.
13.	"	1400KC	"	1400KC	"	A19, A20	Adjust for maximum output. Repeat Steps 12 and 13.
14.	"	190KC	#1	Tuning gang fully closed.	"	A21	Adjust for maximum output.
15.	"	400KC	"	400KC	"	A22	Adjust for maximum output. Repeat Steps 14 and 15.
16.	"	225KC	"	225KC	"	A23, A24	Adjust for maximum output.
17.	"	375KC	"	375KC	"	A25, A26	Adjust for maximum output. Repeat Steps 16 and 17.

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA				NOTES
			CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2N370	RF Amplifier		2N370		2N370	PNP
X2	2N372	Mixer		2N372		2N372	PNP
X3	2N371	Oscillator		2N371		2N371	PNP
X4	2N233A	1st IF Amplifier	2N438		2N1367	2N233A	NPN
X5	2N233A	2nd IF Amplifier	2N438		2N1367	2N233A	NPN
X6	2N306	Driver	2N306	2N649	2N632	2N306	NPN
X7	2N1059	Output	2N444	2N649	2N632	2N1059	NPN } Matched
X8	2N1059	Output	2N444	2N649	2N632	2N1059	NPN } Pair

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA					NOTES
	CAP.	VOLT.	SILVERTONE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1	6	15	18-84-5	PWE25005	NLW6-15	TT25X6	ML6-15	TE-1153	
C2A	20	10	18-105-5	BCD10X5030	ECPAN2			VLS-2248 *	
B	50	10							
C3	50	12	18-94-5	PWE25050	NLW50-15		ML50-15	TE-1133	
C4	50	12	18-94-5	PWE25050	NLW50-15		ML50-15	TE-1133	
C5A	50	12	18-104-5		ECPAN12			VL-2250	
B	50	12							

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

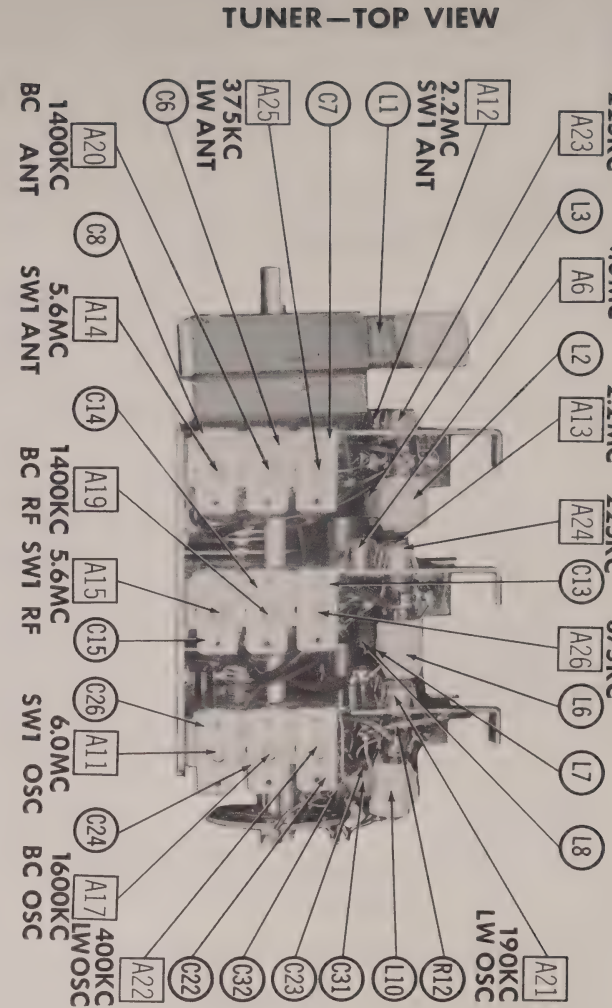
FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C6	4-40	#19-8-6				422		
C7	7-100	#19-7-6				423		
C8	2-25	#19-9-6				421		
C9	2-25	#19-9-6				421		
C10	20000		C80V203AM	DA-203	H-0552	CCD-203	TA-120	TG-S20
C11	100000		C80V104AM	DA-104	H-05P1		BT-010	TG-P10
C12	50000		C80V503AM	DA-503	H-0585		TA-150	TG-S50
C13	7-100	#19-7-6				423		
C14	4-40	#19-8-6				422		
C15	2-25	#19-9-6				421		
C16	2-25	#19-9-6				421		
C17	20000		C80V203AM	DA-203	H-0552	CCD-203	TA-120	TG-S20
C18	100000		C80V104AM	DA-104	H-05P1		BT-010	TG-P10
C19	50000		C80V503AM	DA-503	H-0585		TA-150	TG-S50
C20	220		DI-220	DD-221	L10T22	CCD-221	GP322	10TS-T22
C21	100000		C80V104AM	DA-104	H-05P1		BT-010	TG-P10
C22	7-100	#19-7-6				423		
C23	220 3%	#20-26-2				CM-15-E-22IG		
C24	4-40	#19-8-6				422		
C25	430 2%	#20-29-2				CM-15-E-431G		
C26	2-25	#19-9-6				421		
C27	1300 2%	#20-28-2				CM-19E-432G		
C28	2.2 NPO		NPO-DI 2.2	DTZ-2R2	C10V22C	CCTO-2R2	CNO-522	10TCC-V22
C29	2-25	#19-9-6				421		
C30	5000 2%	#20-25-2				CM-19E-502G	MCE-465	
C31	50000		C80V503AM	DA-503	H-0585		TA-150	TG-S50
C32	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	10TS-D10
C33	470		BPD-00047	DD-471	BYA10T47	CCD-471	GP347	10TS-T47
C34	390		DI-390	DD-390	L10T39	CCD-391	GP339	10TS-T39
C35	150		DI-150	DD-151	L10T15	CCD-151	GP315	10TS-T15
C36	50000		BPD-05	DA-503	H-0585	DP-2-503	TA-150	TG-S50
C37	50000		BPD-05	DA-503	H-0585	DP-2-503	TA-150	TG-S50
C38	50000		BPD-05	DA-503	H-0585	DP-2-503	TA-150	TG-S50
C39	50000		BPD-05	DA-503	H-0585	DP-2-503	TA-150	TG-S50
C40	50000		BPD-05	DA-503	H-0585	DP-2-503	TA-150	TG-S50
C41	50000		BPD-05	DA-503	H-0585	DP-2-503	TA-150	TG-S50
C42	1500		BPD-0015	DD-152	BYA10D15	CCD-152	GP215	10TS-D15

\# Silvertone Part Number.

TUNER—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	SILVERTONE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A B C	50K 5000Ω Switch		24-368-0			† QJ-1255R	■ UE4109-S	Tone Volume Power Off-On

† "Concentrikit" equivalent: K-15 Kit with base elements & shafts: B11-123, P17-024 (Panel)
B13-114, R1-103 (Rear)
76-2 (Switch)

■ "STA-LOC"Equivalent: FB54L, RU53A, OS687, IS1187, US42.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R2	5600Ω	
R3	470Ω	
R4	560Ω	
R5	82K	
R6	4700Ω	
R7	1000Ω	
R8	100K	
R9	10K	
R10	1500Ω	
R11	470Ω	
R12	1000Ω	

ITEM No.	RATING	REMARKS
R13	2200Ω	
R14	3900Ω	
R15	39K	
R16	390Ω	
R17	1200Ω	
R18	4700Ω	
R19	22K	
R20	560Ω	
R21	27K	
R22	6800Ω	
R23	820Ω	

ITEM No.	RATING	REMARKS
R24	220Ω	
R25	1500Ω	
R26	56Ω	
R27	3.3Ω	
R28	1500Ω	
R29	56Ω	
R30	3.3Ω	
R31	3.3Ω	
R32	220Ω	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		SILVERTONE PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Loopstick	82-160-0						
L2	LW Ant. Coil	10-158-1						
L3	SW-1 Ant. Coil	10-159-1						
L4	SW-2 Ant. Coil	10-160-1						
L5	BC RF Coil	10-163-1						
L6	LW RF Coil	10-168-1						
L7	SW-1 RF Coil	10-162-1						
L8	SW-2 RF Coil	10-161-1						
L9	BC Osc. Coil	10-62-4						
L10	LW Osc. Coil	10-61-4						
L11	SW-1 Osc. Coil	10-60-4						
L12	SW-2 Osc. Coil	10-63-4						
L13	1st IF Trans.	10-128-2						
L14	2nd IF Trans.	10-129-2						
L15	3rd IF Trans.	10-130-2						

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA						NOTES
	PRI.	SEC.	SILVERTONE PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2.5	1 SEC. 2 1	80-108-1C ①						

① Alternate Part #80-108-1.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	SILVERTONE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	16Ω	3-4Ω	B80-113-1D ①							

① Alternate Part #80-120-1.

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	SILVERTONE PART No.	QUAM PART No.	
SP1	4" x 6"	PM	3-4Ω	33-443-4	46A1	

BATTERIES

ITEM No.	VOLTAGE	REPLACEMENT DATA							NOTES
		SILVERTONE PART No.	BURGESS		EVEREADY		MALLORY		
			"A"	"B"	"A"	"B"	"A"	"B"	
M1	1.5V	6446 *		130 *		635 *		M-14R *	* 8 Required

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		SILVERTONE PART No.	CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M2	1N60		1N60	1N60	1N60	Detector (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	SILVERTONE PART No.	NOTES
M3	Tuner	84-7976	Complete, Includes 3-Gang Tuning Cap Part #19-34-3
M4	Switch	69-2-3	Wafer (Antenna Section)
M5	Switch	69-7-3	Wafer (RF Section)
M6	Switch	69-5-3	Wafer (Osc. Section #1)
M7	Switch	69-6-3	Wafer (Osc. Section #2)
M8	Antenna	82-161-0	Telescopic
	Printed Board	84-9082	Complete
	Printed Board	25-24-1	Less All Components

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	52-1310-0	Tuning
Knob	52-1308-0	Volume
Knob	52-1307-0	Tone
Knob	52-1309-0	Band Selector
Cabinet	42-96-1	
Handle Ass'y.	49-559	

WIRING DATA

General-use Unshielded Hook-up Wire .....Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

PHOTOFACT® Folder with CIRCUITRACE®

TOSHIBA MODEL 8TM-300S

TOSHIBA MODEL 8TM-300S

TRADE NAME	Toshiba Model 8TM-300S		
IMPORTER	Transistor World Corp., 52 Broadway, New York 4, N. Y.		
TYPE SET	Battery Operated Transistorized 2 Band Portable Receiver		
POWER SUPPLY	4. 5 Volts DC	RATING	12MA @ 4. 5 Volts DC (No Signal, Min. Vol.) 25MA @ 4. 5 Volts DC (Signal, Normal Vol.)
TUNING RANGE-BROADCAST	530-1650KC	SHORT WAVE	3. 85 - 12. 5MC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools:
A1 thru A5..... GENERAL CEMENT #5004, 5009, 8195, 8274, 8275, 8607, 8728, 8987, 8988, 8989, 9291
WALSCO #2515, 2520, 2522, 2523, 2531, 2532, 2534, 2537, 2538
A6, A8, A10, A12... GENERAL CEMENT #5000, 5003, 5066, 8276, 8290, 9087, 9089
WALSCO #2512, 2525, 2528
All ..... GENERAL CEMENT #8721, 8722
WALSCO #2519

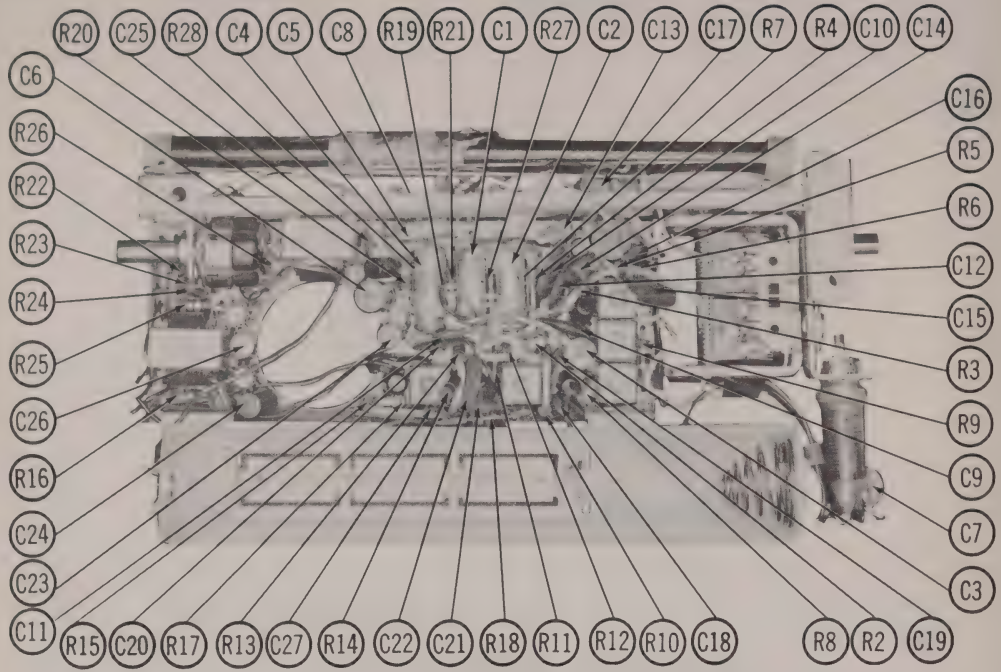
	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	Loop	455KC (400~ Mod)	MW Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
2.	"	530KC	Tuning gang fully closed	"	A5	"
3.	"	1650KC	Tuning gang fully open	"	A6	Adjust for maximum output. Repeat steps 2 and 3.
4.	"	600KC	Tune to 600KC signal	"	A7	Adjust for maximum output.
5.	"	1400KC	Tune to 1400KC signal	"	A8	Adjust for maximum output. Repeat steps 4 and 5.
6.	High side thru 200Ω and 50mmf in series to dipole connection. Low side to chassis.	3. 85MC	SW Tuning gang fully closed	"	A9	Adjust for maximum output.
7.	"	12. 5MC	Tuning gang fully open	"	A10	Adjust for maximum output. Repeat steps 6 and 7.
8.	"	4. 0MC	Tune to 4. 0MC signal	"	A11	Adjust for maximum output.
9.	"	9. 5MC	Tune to 9. 5MC signal	"	A12	Adjust for maximum output. Repeat steps 8 and 9.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

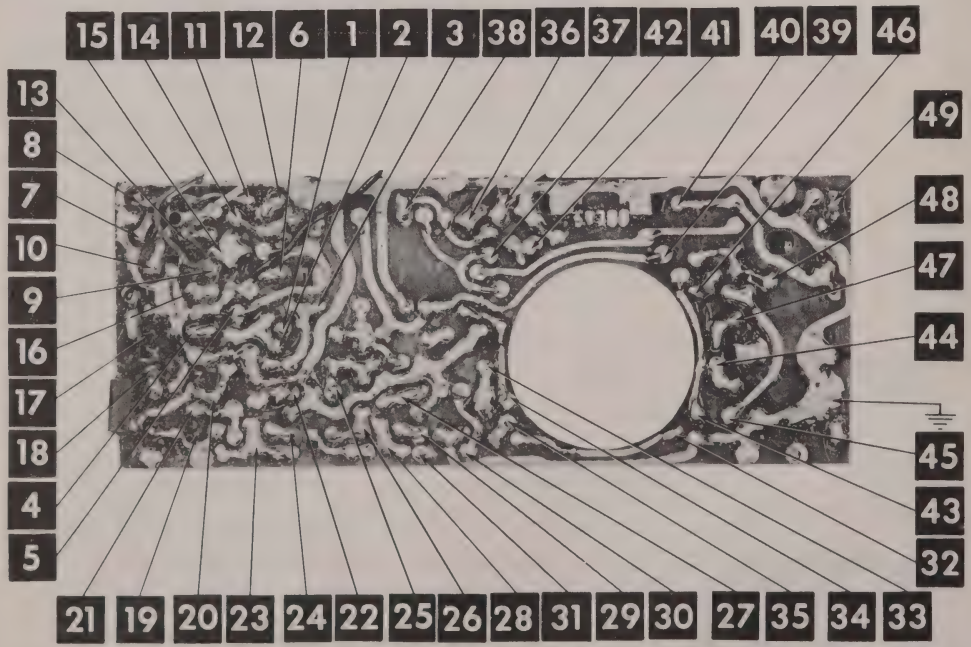
The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of JF709

the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1960 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

SET 485 FOLDER 17

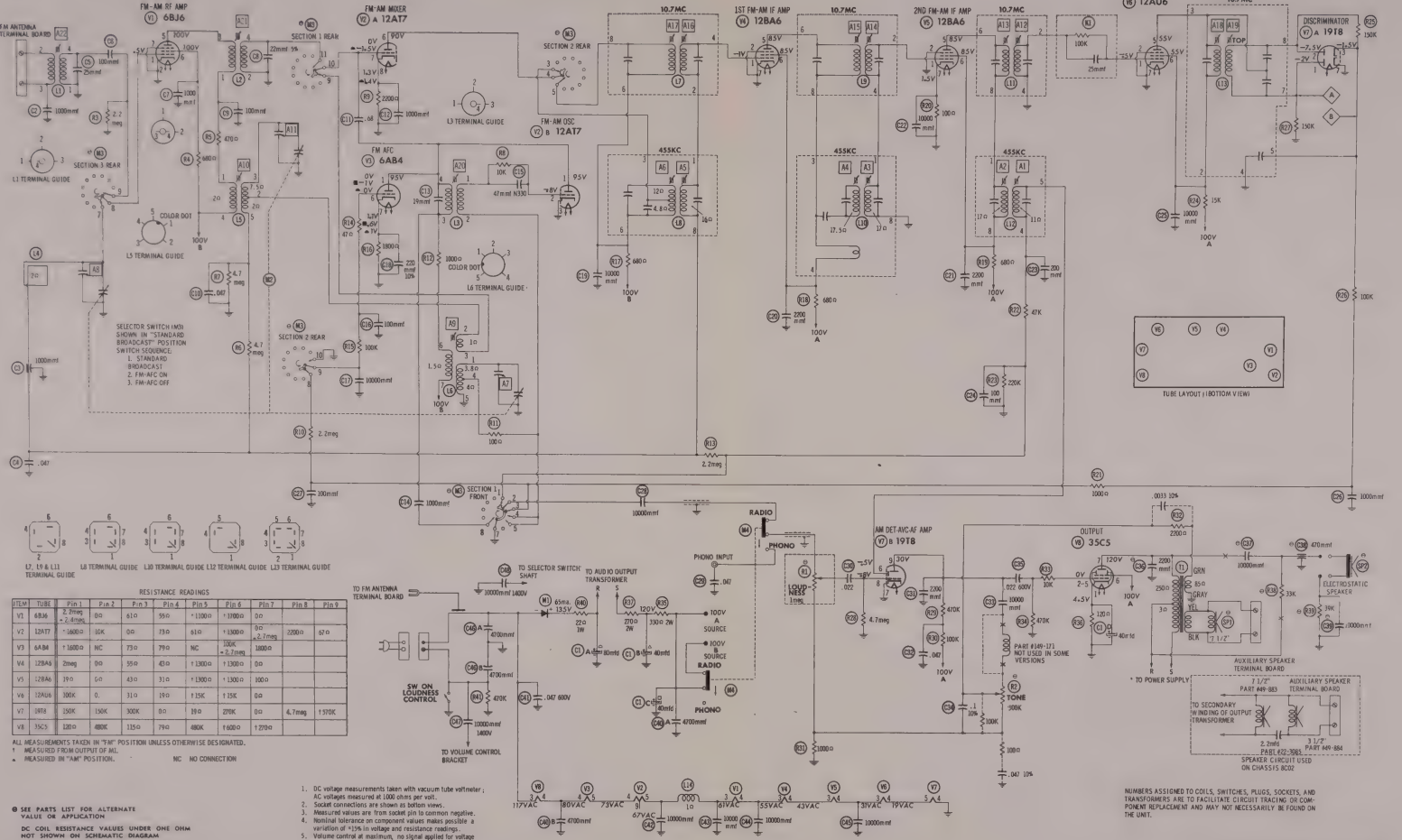


CHASSIS TOP VIEW-CAPACITOR AND RESISTOR IDENTIFICATION



A Howard W. Sams CIRCUITRACE Photo

PRINTED BOARD



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BJ6	2.7meg ± 2.4meg	0Ω	61Ω	55Ω	↑1300Ω	↑1700Ω	0Ω		
V2	12AT7	↑1600Ω	10K	0Ω	73Ω	61Ω	↑1300Ω	0Ω ± 2.7meg	2200Ω	67Ω
V3	6AB4	↑1600Ω	NC	73Ω	79Ω	NC	↑1300Ω	180K ± 2.7meg	1800Ω	
V4	12BA6	2meg	0Ω	55Ω	43Ω	↑1300Ω	↑1300Ω	0Ω		
V5	12BA6	19Ω	0Ω	43Ω	31Ω	↑1300Ω	↑1300Ω	100Ω		
V6	12AU6	100K	0.	31Ω	19Ω	↑15K	↑15K	0Ω		
V7	19T8	150K	150K	300K	0Ω	19Ω	270K	0Ω	4.7meg	↑570K
V8	35C5	120Ω	480K	115Ω	79Ω	480K	↑600Ω	↑270Ω		

ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE DESIGNATED.
↑ MEASURED FROM OUTPUT OF M1.
▲ MEASURED IN "AM" POSITION. NC NO CONNECTION

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC
® Howard W. Sams & Co., Inc. 1960

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±5% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

ZENITH MODELS C835E, H, R, W, C845L, M, W, Y (Ch. 8C01, 8C02)

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA				NOTES
			CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2S93A	Mixer			2N485		PNP
X2	2S92A	Oscillator			2N486		PNP
X3	2S49	1st IF Amplifier		2N410	2N483	2N410	PNP
X4	2S53	2nd IF Amplifier		2N410	2N483	2N410	PNP
X5	2S53	Detector & AGC		2N410	2N483	2N410	PNP
X6	2S54	Driver		2N406	2N362	2N406	PNP
X7	2S22 ♦	Output		2N270	2N632		PNP
X8	2S22 ♦	Output		2N270	2N632		PNP

♦ Matched pair with heat sink.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	TOSHIBA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1	60	3	6M60	XPP-3060	NLW60-6	TT6X60	ML75-6	TE-1101	
C2	60	3	6M60	XPP-3060	NLW60-6	TT6X60	ML75-6	TE-1101	
C3	40	3	3M40	XPP-3040	NLW40-3	TT3X40	ML40-6	TE-1057	
C4	60	3	6M60	XPP-3060	NLW60-6	TT6X60	ML75-6	TE-1101	
C5	8	3	3M8	XPP-3008	NLW8-6	TT6X8	ML8-6	TE-1052. 5	
C6	40	3	3M40	XPP-3040	NLW40-3	TT3X40	ML40-6	TE-1057	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C7	5		DI-5	DD-050	L10V5			10TS-V50
C8A B C D								
C9	50000		BPD-05	DD-503	H-05S5		TA-150	TG-S50
C10	50000		BPD-05	DD-503	H-05S5		TA-150	TG-S50
C11	10000		BPD-01	DD-103	BYA10S1	CCD-103	TA-110	TG-S10
C12	20000		BPD-02	DD-203	BYB6S2	CCD-203	TA-120	TG-S20
C13	500 5%		1469-0005		22R5T5	CM-19B-501J	MCE245	MS-35
C14	3300 10%		1464-0033		1R5D33	CM-19B-332K	MCJ462	MS-233
C15	5000		BPD-005	DD-502	BYA10D5	CCD-502	TA-250	TG-D50
C16	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C17	400 5%		1468-0004		5W5T4	CM-19B-391J	MCE243	MS-34
C18	6.8		NPO-DI 6.8	DTZ-6R8	C10V68C	CCTO-6R8	CNO-568	10TCC-V68
C19	20000		BPD-02	DD-203	BYB6S2	CCD-203	TA-120	TG-S20
C20	20000		BPD-02	DD-203	BYB6S2	CCD-203	TA-120	TG-S20
C21	3 ±.5mmf		NPO-DI 3.0	DTZ-3R3	C10V3C	CCTO-3R3	CNO-533	10TCC-V33

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C22	50000		BPD-05	DD-503	H-05S5		TA-150	TG-S50
C23	50000			DD-503	H-05S5	1DP-2-503	TA-150	TG-S50
C24	50000			DD-503	H-05S5	1DP-2-503	TA-150	TG-S50
C25	5000			DD-502	BYA10D5	1DP-1-502	TA-250	TG-D50
C26	50000			DD-503	H-05S5	1DP-2-503	TA-150	TG-S50
C27	10000		BPD-01	DD-103	BYA10S1	CCD-103	TA-110	TG-S10

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	TOSHIBA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1	2000Ω	1/4	40287					Volume & Switch

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R2	12K	
R3	15K	
R4	2200Ω	
R5	5600Ω	
R6	18K	
R7	1200Ω	
R8	18K	
R9	3900Ω	
R10	1000Ω	

ITEM No.	RATING	REMARKS
R11	22K	
R12	4700Ω	
R13	470Ω	
R14	2200Ω	
R15	2200Ω	
R16	150K	
R17	47Ω	
R18	1500Ω	
R19	22K	

ITEM No.	RATING	REMARKS
R20	6200Ω	
R21	470Ω	
R22	1800Ω	
R23	150Ω	
R24	Temp. Comp.	#M-8602
R25	4.7Ω	
R26	47Ω	
R27	47Ω	
R28	220Ω	

Toshiba Part No.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		TOSHIBA PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	SW Ant. Coil	LH-99						
L2	Loopstick	LH-96A						
L3	SW Osc. Coil	LH-147						
L4	BC Osc. Coil	LH-186A						
L5	1st IF Trans.	IT-1031						
L6	2nd IF Trans.	IT-1032						
L7	3rd IF Trans.	IT-1033						
L8	4th IF Trans.	IT-1034						

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA						NOTES
	PRI.	SEC.	TOSHIBA PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	L 4	1	DT-0710						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	TOSHIBA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	160Ω	8Ω	MT-0769							

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	TOSHIBA PART No.	QUAM PART No.	
SP1	3 9/16"	PM	6-8Ω	SP-3501A	3A07	

BATTERIES

ITEM No.	VOLTAGE	TOSHIBA PART No.	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
			"A"	"B"	"A"	"B"	"A"	"B"	
M1	1. 5V	UM2 *		130 *		635 *		M-14R *	* 3 Required

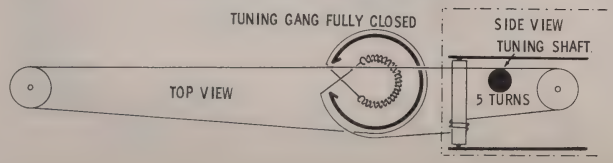
MISCELLANEOUS

ITEM No.	PART NAME	TOSHIBA PART No.	NOTES
M2 M3	Tuning Cap. Bandswitch	VC-2026	2 Gang

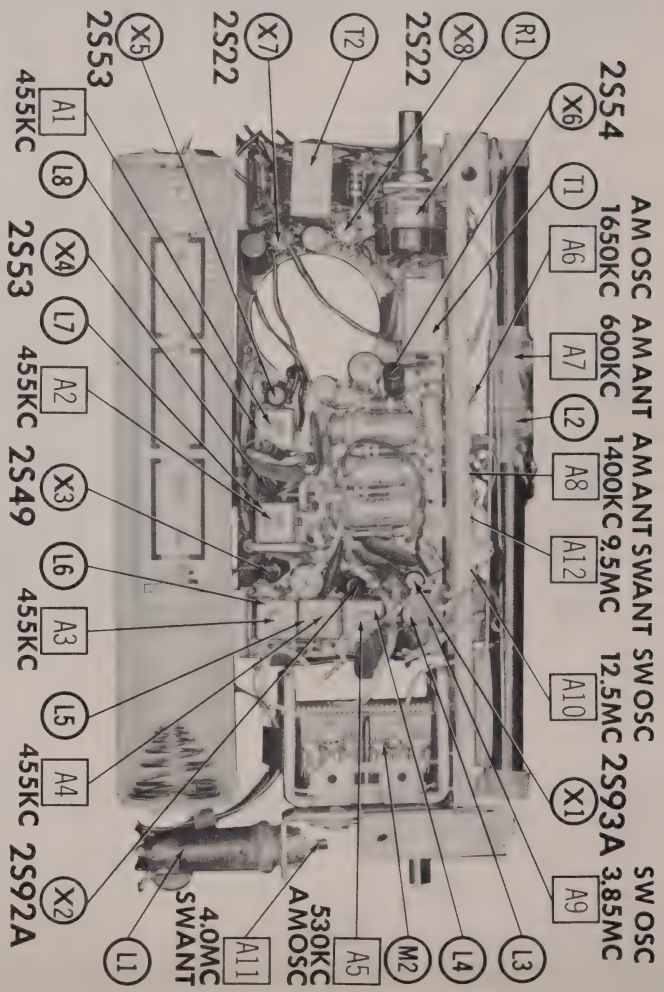
WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

DIAL CORD STRINGING



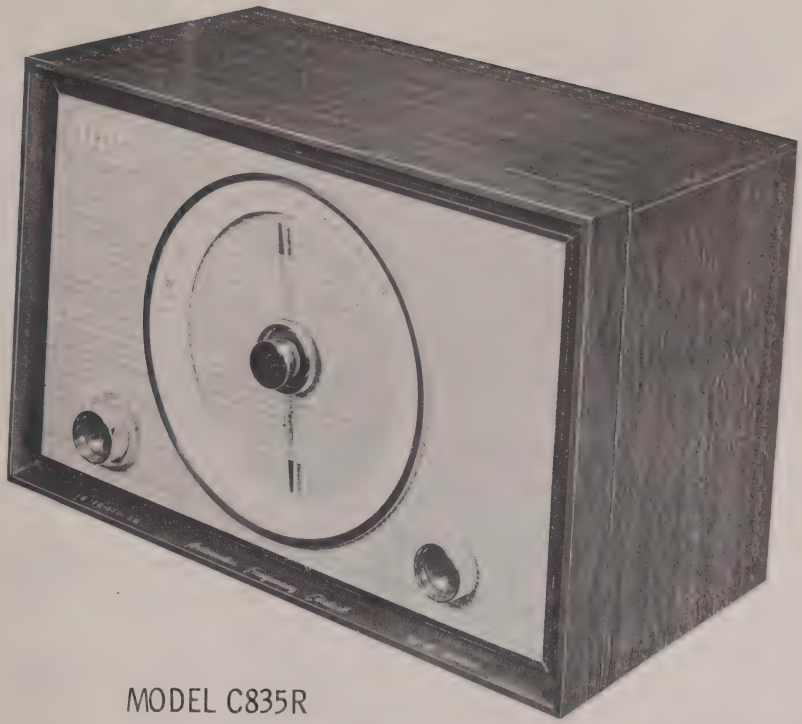
CHASSIS—TOP VIEW



PHOTOFACT® Folder

ZENITH MODELS C835E, H, R, W, C845L, M, W, Y (Ch. 8C01, 8CO2)

ZENITH MODELS C835E, H, R, W, C845L, M, W, Y (Ch. 8C01, 8CO2)

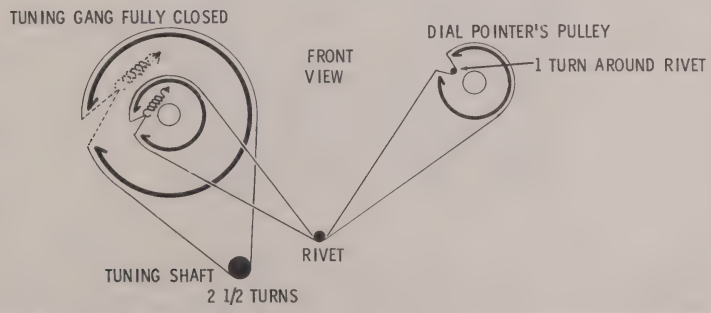


MODEL C835R

ZENITH MODELS C835E, H, R, W, C845L, M, W, Y (Ch. 8C01, 8CO2)

TRADE NAME	Zenith Models C835E, C835H, C835R, C835W (Ch. 8C01); C845L, C845M, C845W, C845Y (Ch. 8C02)		
MANUFACTURER	Zenith Radio Corp., 6001 Dickens Ave., Chicago 39, Illinois		
TYPE SET	AC-DC Operated 8 Tube FM-AM Receiver		
POWER SUPPLY	110-120 Volts AC-DC	RATING	29 Watts, .32 Amp. @ 117 Volts, AC
TUNING RANGE	BROADCAST 535-1620KC	FREQ. MOD.	88-108MC

DIAL CORD STRINGING



HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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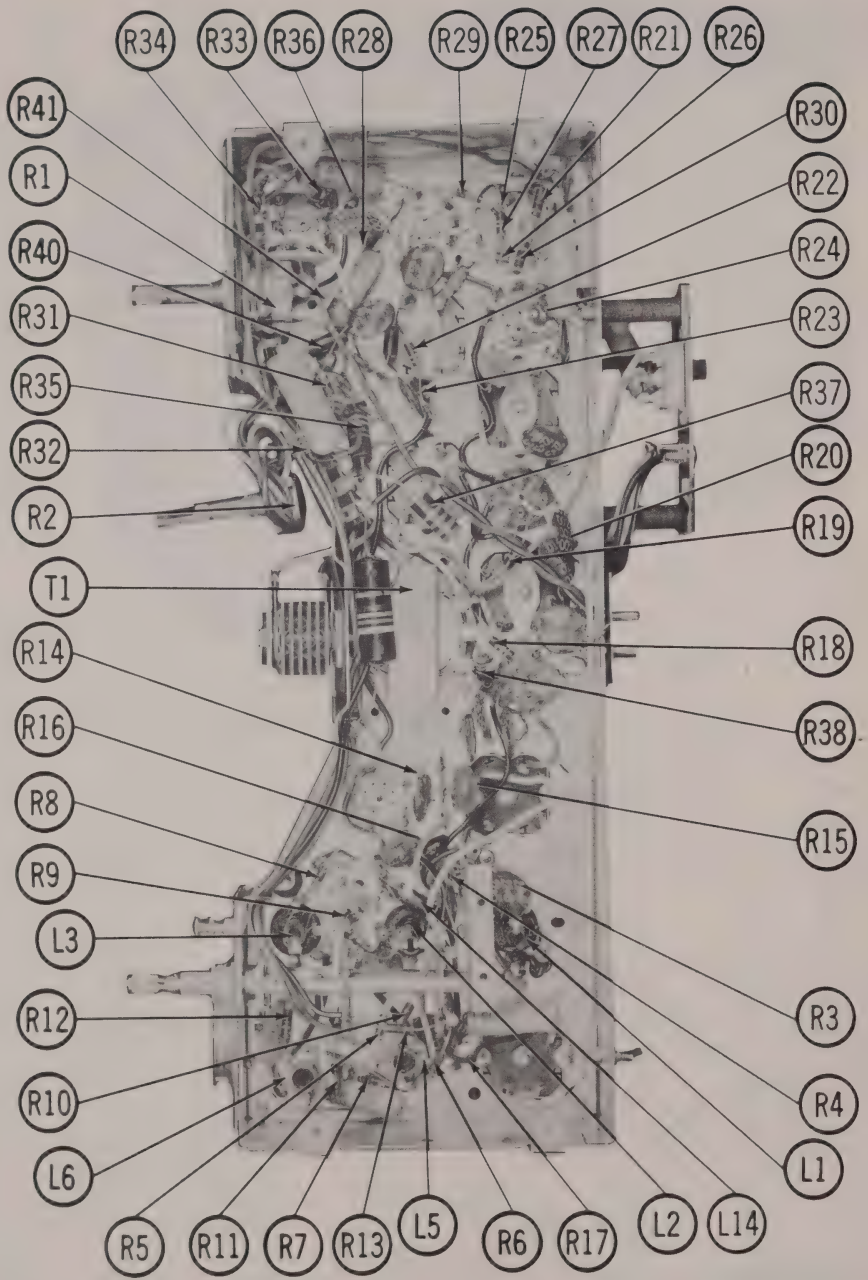
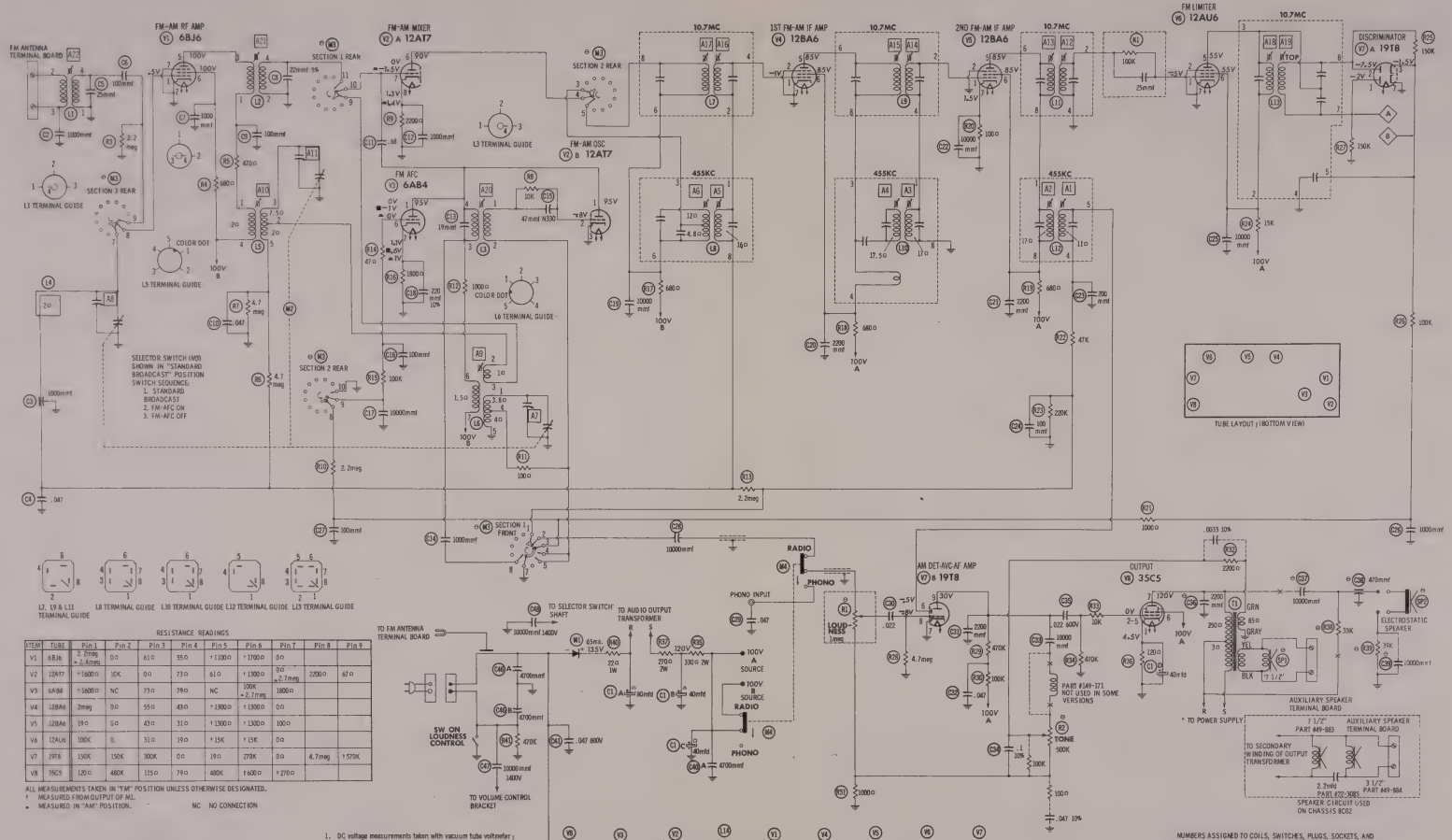
JK546

SET 485 FOLDER 18



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BJ6	2.7meg + 2.4meg	0Ω	61Ω	55Ω	†1100Ω	†1700Ω	0Ω		
V2	12AT7	†1600Ω	10K	0Ω	73Ω	61Ω	†1300Ω	0Ω + 2.7meg	2200Ω	67Ω
V3	6AB4	†1600Ω	NC	73Ω	79Ω	NC	100K + 2.7meg	1800Ω		
V4	12BA6	2meg	0Ω	55Ω	43Ω	†1300Ω	†1300Ω	0Ω		
V5	12BA6	19Ω	6Ω	43Ω	31Ω	†1300Ω	†1300Ω	100Ω		
V6	12AU6	100K	0Ω	31Ω	19Ω	†15K	†15K	0Ω		
V7	19T8	150K	150K	300K	0Ω	19Ω	270K	0Ω	4.7meg	†570K
V8	35C5	120Ω	480K	115Ω	79Ω	480K	†600Ω	†270Ω		

ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE DESIGNATED.
† MEASURED FROM OUTPUT OF M3.
▪ MEASURED IN "AM" POSITION. NC NO CONNECTION

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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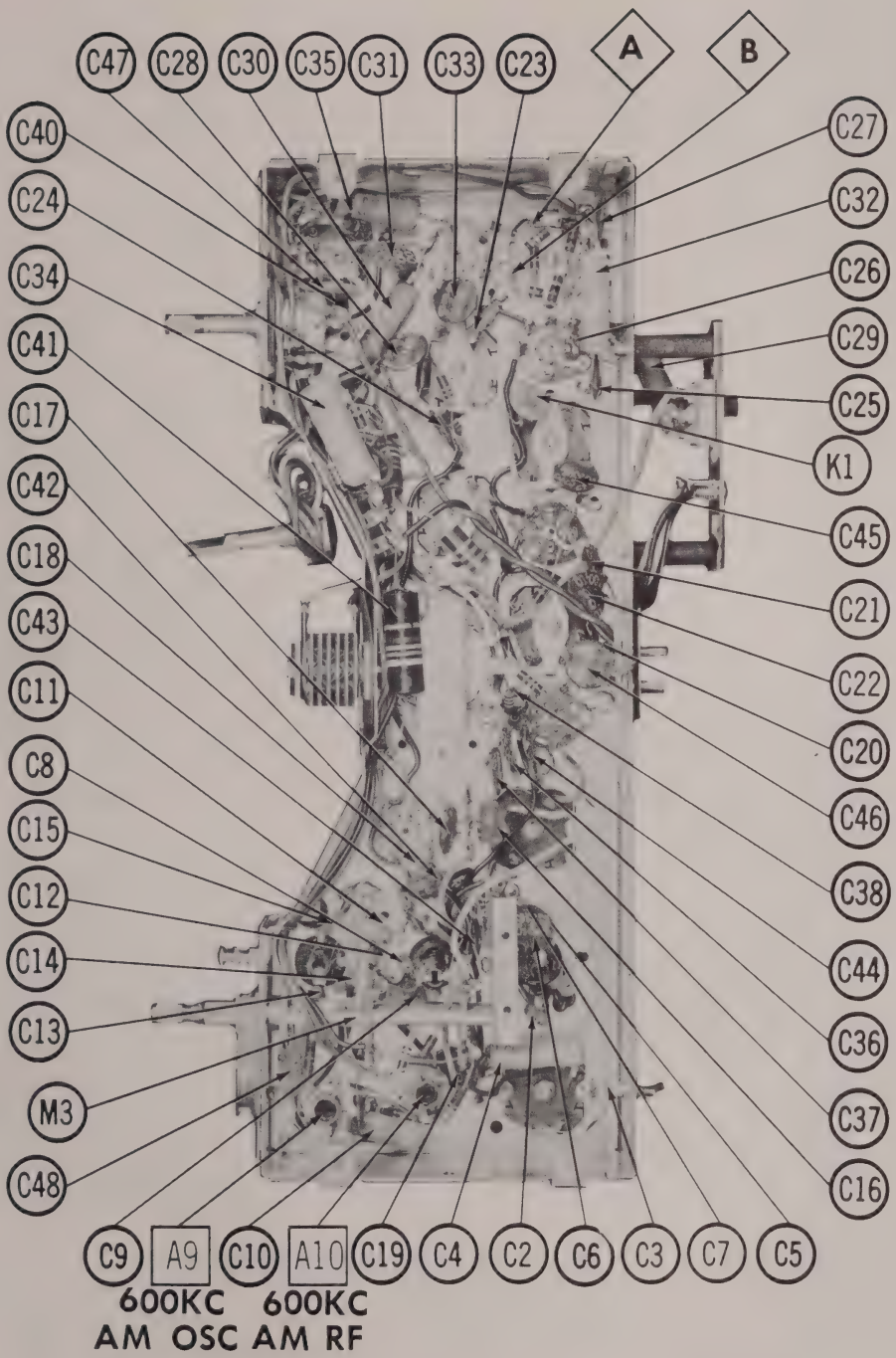
1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

ZENITH MODELS C835E, H, R, W, C845L, M, W, Y (Ch. 8C01, 8C02)



CHASSIS BOTTOM VIEW—ALIGNMENT, CAPACITOR & MISC. IDENT.

ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools: A1 thru A6, A8, A10 thru A17 .... GENERAL CEMENT #8282, 8606, 8606L, 9295
WALSCO #2526, 2543, 2544, 2545

A7, A9 ..... GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520

AM ALIGNMENT - SELECTOR IN AM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	High side thru .05mfd to pin 7 (grid) of Mixer. Low side to chassis.	455KC (400∿ Mod.)	(AM) Tuning gang fully closed	Across voice coil	A1, A2, A3, A4, A5, A6	Adjust for maximum output.
2.	Loop	1600KC	1600KC	"	A7, A8	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.	"	600KC	600KC	"	A9, A10	"
4.	"	1400KC	Tune to 1400KC	"	A11	Adjust for maximum output while rocking tuning gang.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM - SELECTOR IN FM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
5.	High side thru .05mfd to pin 7 (grid) of Mixer. Low side to chassis.	10.7MC (Unmod.)	(FM) Point of non-interference	DC probe to pin 1 (grid) of FM Limiter. Common to chassis.	A12, A13, A14, A15, A16, A17	Adjust for maximum deflection.
6.	"	"	"	DC probe to point (A). Common to chassis.	A18	"
7.	"	"	"	DC probe to point (B). Common to chassis.	A19	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE - SELECTOR IN FM POSITION

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
5.	High side thru .05mfd to pin 7 (grid) of Mixer. Low side to chassis.	10.7MC (450KC swp)	(FM) Point of non-interference	Vert. Amp. to pin 1 (grid) of Limiter. Low side to chassis.	A12, A13, A14, A15, A16, A17	Adjust for maximum gain and symmetry of response similar to Fig. 1 with marker as shown.
6.	"	"	"	Vert. Amp. thru 27K to point (A). Low side to chassis.	A18	"
7.	"	"	"	Vert. Amp. to point B. Low side to chassis.	A19	Adjust to place marker at the center of crossover lines similar to Fig. 2. SLIGHTLY retouch A16 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT - SELECTOR IN FM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
8.	Across FM antenna terminals with 270Ω in high side.	98MC (Unmod.)	(FM) 98MC	DC probe to pin 1 (grid) of Limiter. Common to chassis.	A20, A21, A22	Adjust for maximum deflection.

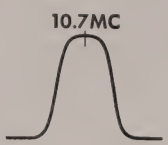


FIG. 1

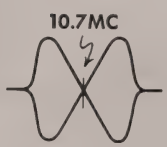


FIG. 2

PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆	GENERAL ELECTRIC ◆	RAYTHEON ◆	SYLVANIA ◆

ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	FM-AM RF Amplifier	6BJ6	V5	2nd FM-AM IF Amp.	12BA6
V2	FM-AM Mixer-Osc.	12AT7	V6	FM Limiter	12AU6
V3	FM AFC	6AB4	V7	Discriminator - AM Det. - AVC - AF Amp.	19T8
V4	1st FM-AM IF Amp.	12BA6	V8	Output	35C5

ELECTROLYTIC CAPACITORS

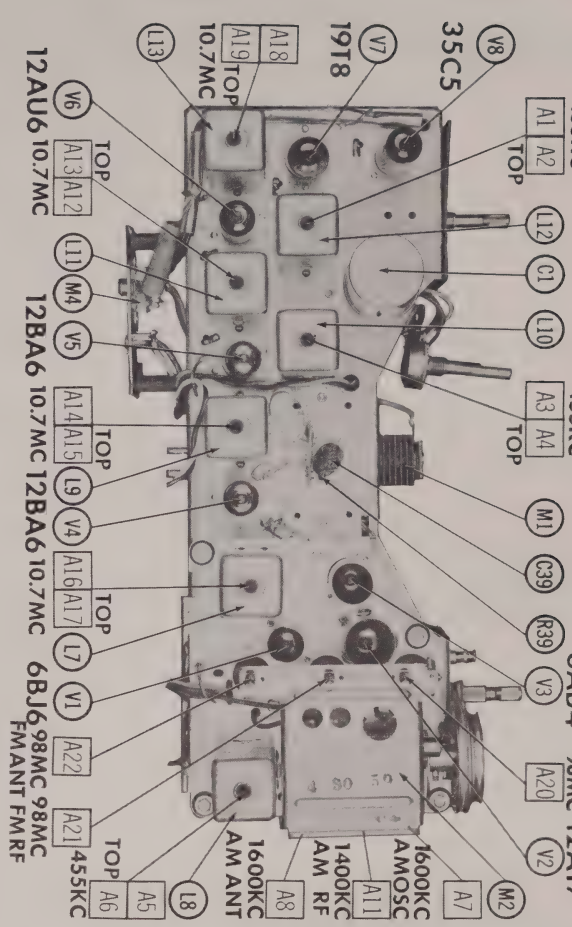
ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA ZENITH PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	●80	150	22-1661	AFH4-37-10	D0325	FP41L 32	TMQ-36	TVL-4432	
B	▲40	150							
C	■40	150							
D	40	25							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	1000		SI 1000	D6-102	BYA10D1	CCD-102	GP210	5HK-D10
C3	1000		EF-001	MFT-1000		CCF-102	CT280A	
C4	.047 200V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C5	25		NPO-SI 25	TCZ-25	C10Q25C	CCTO-270	CNO-425	10TCC-Q25
C6	100		BPD-0001	DD-101	L10T1	CCD-101	GP310	10TS-T10
C7	1000		SI 1000	D6-102	BYA10D1	CCD-102	GP210	5HK-D10
C8	22 5%		NPO-SI 22	TCZ-22	C10Q22C	CM-19B-220J	CNO-422	10TCC-Q22
C9	100		BPD-0001	DD-101	L10T1	CCD-101	GP310	10TS-T10
C10	.047 200V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C11	.68	#22-1766	NPO-SI .68	TCZ-R68				
C12	1000		SI 1000	D6-102	BYA10D1	CCD-102	GP210	5HK-D10
C13	19		NPO-SI 20	TCZ-20	C10Q2C	CM-19B-200J	CNO-418	10TCC-Q20
C14	1000		SI 1000	D6-102	BYA10D1	CCD-102	GP210	5HK-D10
C15	47 N330			TCA-47		*		
C16	100		BPD-0001	DD-101	L10T1	CCD-101	GP310	10TS-T10
C17	10000		BPD-01	DD-103	BYA10SI	CCD-103	GP110	5HK-SI0
C18	220 10%		DI-220	D6-221	L10T1	CCD-221	GP322	10TS-T22
C19	10000		BPD-01	DD-103	BYA10SI	CCD-103	GP110	5HK-SI0
C20	2200		BPD-0022	DD-222	BYA10D22	CCD-222	GP222	5HK-D22
C21	2200		BPD-0022	DD-222	BYA10D22	CCD-222	GP222	5HK-D22
C22	10000		BPD-01	DD-103	BYA10SI	CCD-103	GP110	5HK-SI0
C23	200		SI 200	D6-201	L10T2	CCD-201	GP320	10TS-T20
C24	100		BPD-0001	DD-101	L10T1	CCD-101	GP310	10TS-T10
C25	10000		BPD-01	DD-103	BYA10SI	CCD-103	GP110	5HK-SI0
C26	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C27	100		BPD-0001	DD-101	L10T1	CCD-101	GP310	10TS-T10
C28	10000		BPD-01	DD-103	BYA10SI	CCD-103	GP110	5HK-SI0
C29	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C30	.022 400V		P488N-022	DD-203	CUB4S22	4DP-2-223	GEM-4122	4TM-S22
C31	2200		BPD-0022	DD-222	BYA10D22	CCD-222	GP222	5HK-D22
C32	.047 200V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C33	10000		BPD-01	DD-103	BYA10SI	CCD-103	GP110	5HK-SI0
C34	.1 200V 10%		V84C2P1-10%		PM2P1	2PD-3-104	GEM-201	2TM-P1
C35	.022 600V		P688N-022	DD-203	CUB6S22	6DP-2-223	GEM-6122	6TM-S22
C36	2200	Note 1	BPD-0022	DD-222	BYA10D22	CCD-222	GP222	5HK-D22
C37	10000	Note 2	BPD-01	DD-103	BYA10SI	CCD-103	GP110	5HK-SI0
C38	470	Note 2	EF-0005	MFT-500		CCF-501		
C39	10000	Note 2	BPD-01	DD-103	BYA10SI	CCD-103	GP110	5HK-SI0
C40A	4700					CCD-472		
B	4700		BPD-2X0047	DD2-502	BYC6DD47	CCD-472	B2X250	5HK-2D47
C41	.047 600V		P688N-047	DD-503	CUB6S47	6DP-3-473	GEM-6147	6TM-S47
C42	10000		BPD-01	DD-103	BYA10SI	CCD-103	GP110	5HK-SI0
C43	10000		BPD-01	DD-103	BYA10SI	CCD-103	GP110	5HK-SI0
C44	10000		BPD-01	DD-103	BYA10SI	CCD-103	GP110	5HK-SI0
C45	10000		BPD-01	DD-103	BYA10SI	CCD-103	GP110	5HK-SI0
C46A	4700					CCD-472		
B	4700		BPD-2X0047	DD2-502	BYC6DD47	CCD-472	B2X250	5HK-2D47
C47	10000 1400V		DAC-27	DD16-103	HVE16SI	16DP-3-103	UAC-110	BL-SI0

CHASSIS—TOP VIEW



ZENITH MODELS C835E, H, R, W, C845L, M, W, Y (Ch. 8C01, 8C02)

FOLDER 1 8

PARTS LIST AND DESCRIPTIONS (Continued)

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C48	10000 1400V		DAC-27	DD16-103	HVE16S1	16DP-3-103	UAC-110	BL-S10

Zenith Part Number.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.
Note 1. Chassis 8C02 uses 4700mmf 10% in this application.
Note 2. Not used in Chassis 8C02.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	ZENITH PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	1meg	½	63-4615	B-70-S	A47-1meg-Z	Q13-137	U53	Loudness Note 1
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
C	Switch			Not Req.	SWE-12	76-1	US-26	Power Off-On
R2A	500K	½	63-4614	B-59	A47-500K-S	Q11-133	U50	Tone Note 2
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	

Note 1. Chassis 8C02 uses 1 meg volume and switch (Part #63-4479).
Note 2. Chassis 8C02 uses 500K Tone (Part #63-4480).

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R3	2.2meg	
R4	680Ω	
R5	470Ω	
R6	4.7meg	
R7	4.7meg	
R8	10K	
R9	2200Ω	
R10	2.2meg	
R11	100Ω	
R12	1000Ω	
R13	2.2meg	
R14	47Ω	
R15	100K	

ITEM No.	RATING	REMARKS
R16	1800Ω	
R17	680Ω	
R18	680Ω	
R19	680Ω	
R20	100Ω	
R21	1000Ω	
R22	47K	
R23	220K	
R24	15K	
R25	150K	
R26	100K	
R27	150K	
R28	4.7meg	

ITEM No.	RATING	REMARKS
R29	470K	
R30	100K	
R31	1000Ω	
R32	2200Ω	
R33	10K	
R34	470K	
R35	330Ω 2W	
R36	120Ω	
R37	270Ω 2W	
R38	33K	Note 1
R39	39K	Note 1
R40	22Ω 1W	
R41	470K	

Note 1. Not used in Chassis 8C02

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	ZENITH PART No.	REPLACEMENT DATA
K1	FM Limiter Cath. Bias	25mmf, 100K	105-42	Sprague PRC-11

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		ZENITH PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	FM Antenna Coil	S-14192						
L2	FM RF Coil	S-15743						
L3	FM Osc. Coil	S-15691						
L4	Loopstick	S-46918						
L5	AM RF Coil	S-41088						
L6	AM Osc. Coil	S-43475						
L7	1st FM IF	95-1201	16-6665	16-6665	FM-251 ▲	1451 ▲		
L8	1st AM IF	95-1248						
L9	2nd FM IF	95-1150	16-3487 *	16-3487 *	FM-251 ▲	1451 ▲		
L10	2nd AM IF	95-1249						
L11	3rd FM IF	95-1150	16-3487 *	16-3487 *	FM-251 ▲	1451 ▲		
L12	3rd AM IF	95-1254	16-5742	16-5742	BC-340	912-C4		
L13	Discriminator	95-1153						
L14	Fil. Choke	8-13997	19-1005	19-1005	BC-566	4612		9.5uh

▲ Enlarge mounting holes. * Use adapter plate.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	ZENITH PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2600Ω Tap @ 1½	25Ω SEC.2 3-4Ω	95-1662							

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	ZENITH PART No.	QUAM PART No.	
SP1	7⅛"	PM		49-608 ①		① Models C835 Series
SP2	Electrostatic			S-23829 ①		② Models C845 Series
	7⅛"	PM		49-883 ②		
	3½"	PM		49-884 ②		

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA					NOTES
	CURRENT (Measured)	ZENITH PART No.	INTERNATIONAL PART No.	ITT PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	
M1	.065A	212-23 ① 212-13 ②	T100 ①	1235AH ①	100A ①	SR200 ③	① Selenium Type ② Alternate Part No. ③ Silicon Type

MISCELLANEOUS

ITEM No.	PART NAME	ZENITH PART No.	NOTES
M2	Tuning Cap.	22-1677	3 Gang, AM (Ant. 24-410mmf, RF 16-213mmf, Osc. 18-92mmf)
M3	Switch	85-630	FM-AM
		85-662	FM-AM, Chassis 8C02
M4	Switch	85-495	Radio-Phono (DPDT Slide Type)

CABINETS & CABINET PARTS

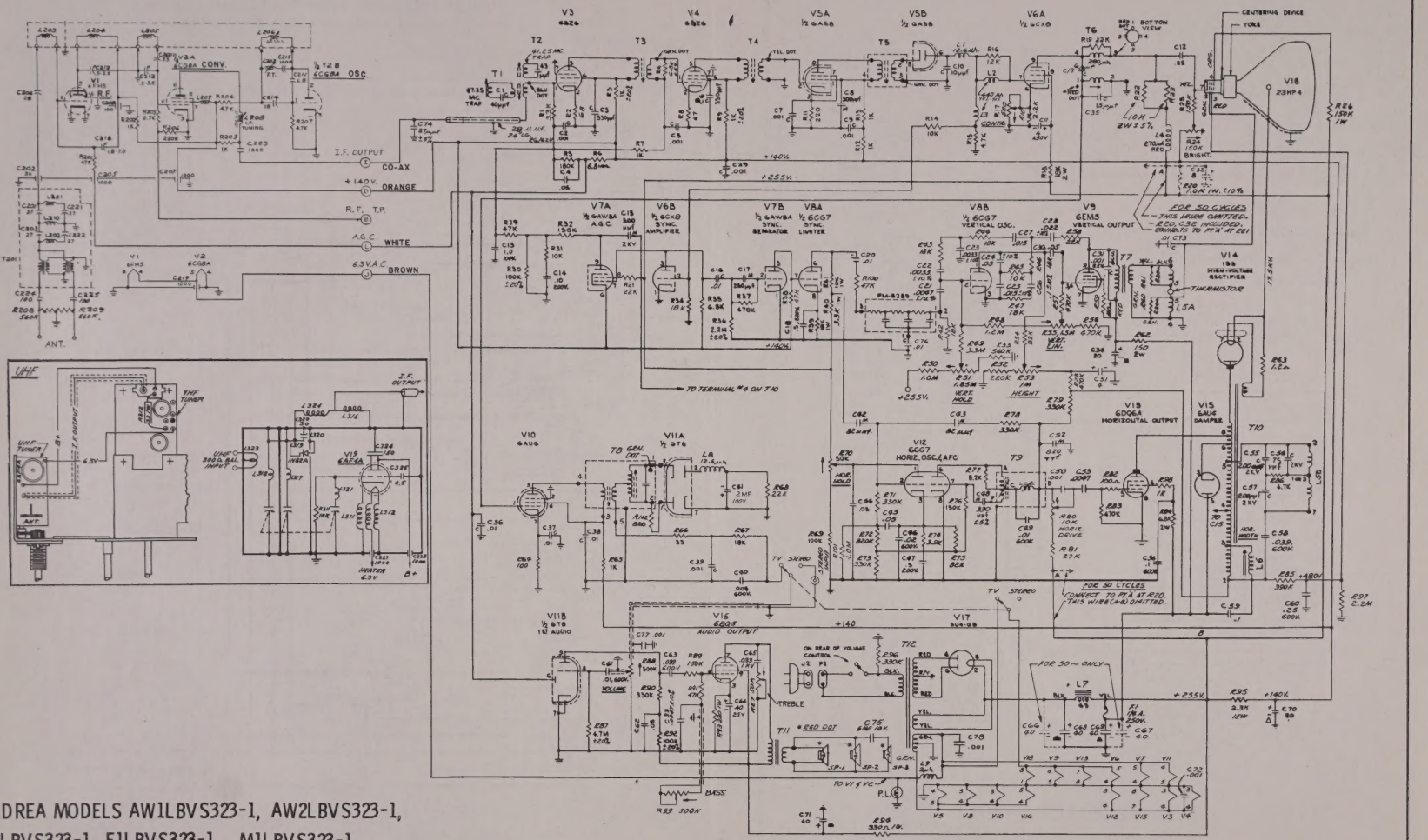
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	S-46356	Tuning
Knob	46-2062	Volume, Band Switch, Model C835 Series
Knob	S-44167	Volume, Tone, Models C845 Series
Knob	S-46937	Tone, Model C835 Series
Dial Pointer	S-46938	Models C835 Series
Dial Pointer	59-351	Models C845 Series
Dial Assembly	S-46487	Includes Grille, Dial Scale, & Plate; Models C845 Series
Dial Scale	26-646	Models C835 Series
Cabinet	14-2752W	Model C835W
Cabinet	14-2752E	Model C835E
Cabinet	14-2752H	Model C835H
Cabinet	14-2752R	Model C835R
Cabinet	14-2671W	Model C845W
Cabinet	14-2671L	Model C845L
Cabinet	14-2671M	Model C845M
Cabinet	14-2671Y	Model C845Y

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)



ANDREA MODELS AW1LBVS323-1, AW2LBVS323-1,
B1LBVS323-1, E1LBVS323-1, M1LBVS323-1,
M2LBVS323-1, W1LBVS323-1, W2LBVS323-1,
WF1LBVS323-1, WF2LBVS323-1 (CH. VS323-1)

Schematic Diagram Courtesy of Andrea Radio Corp.

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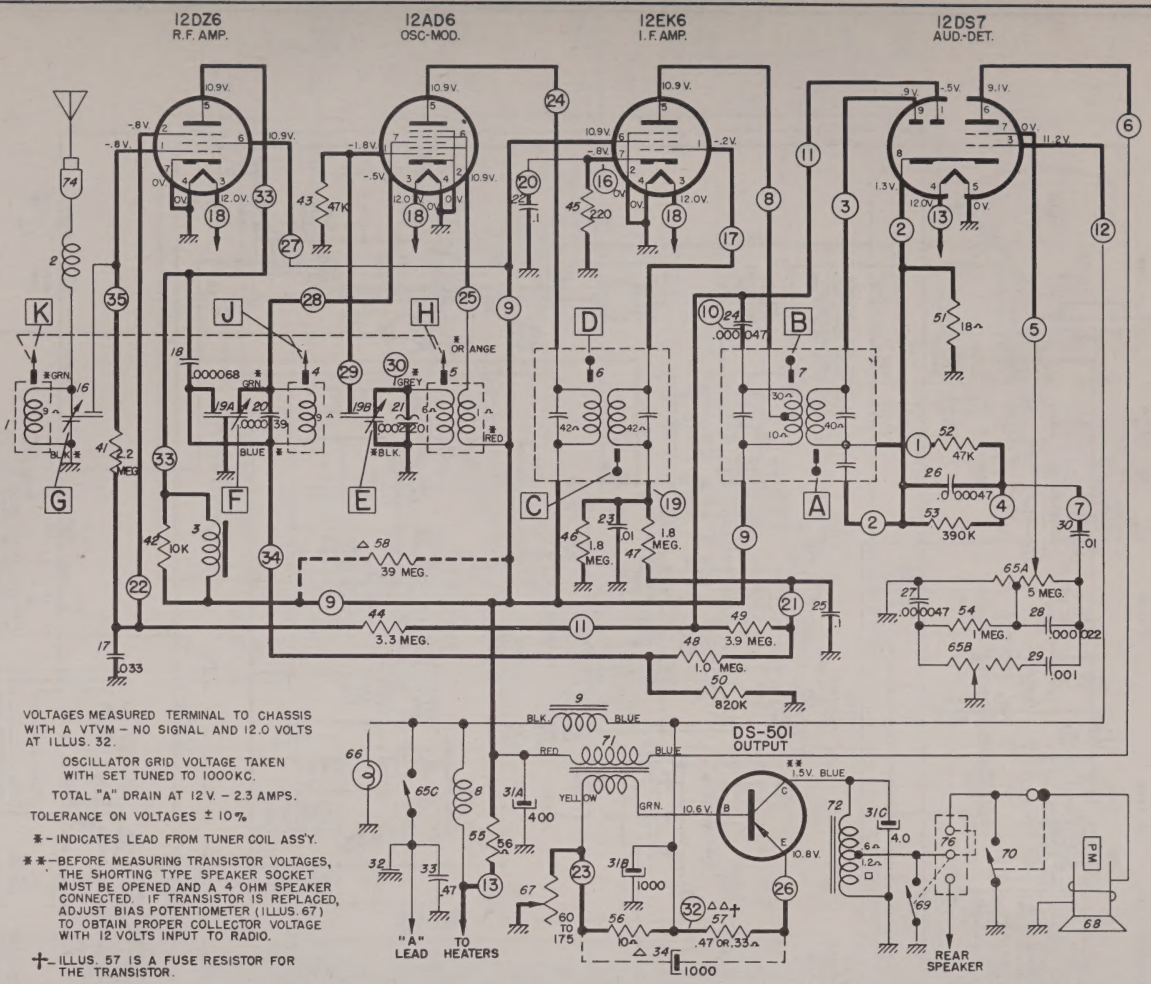
OLDSMOBILE MODEL 982276



VOLTAGES MEASURED TERMINAL TO CHASSIS WITH A VTVM – NO SIGNAL AND 12.0 VOLTS AT ILLUS. 32.

OSCILLATOR GRID VOLTAGE TAKEN WITH SET TUNED TO 1000KC.

TOTAL "A" DRAIN AT 12 V. – 2.3 AMPS.

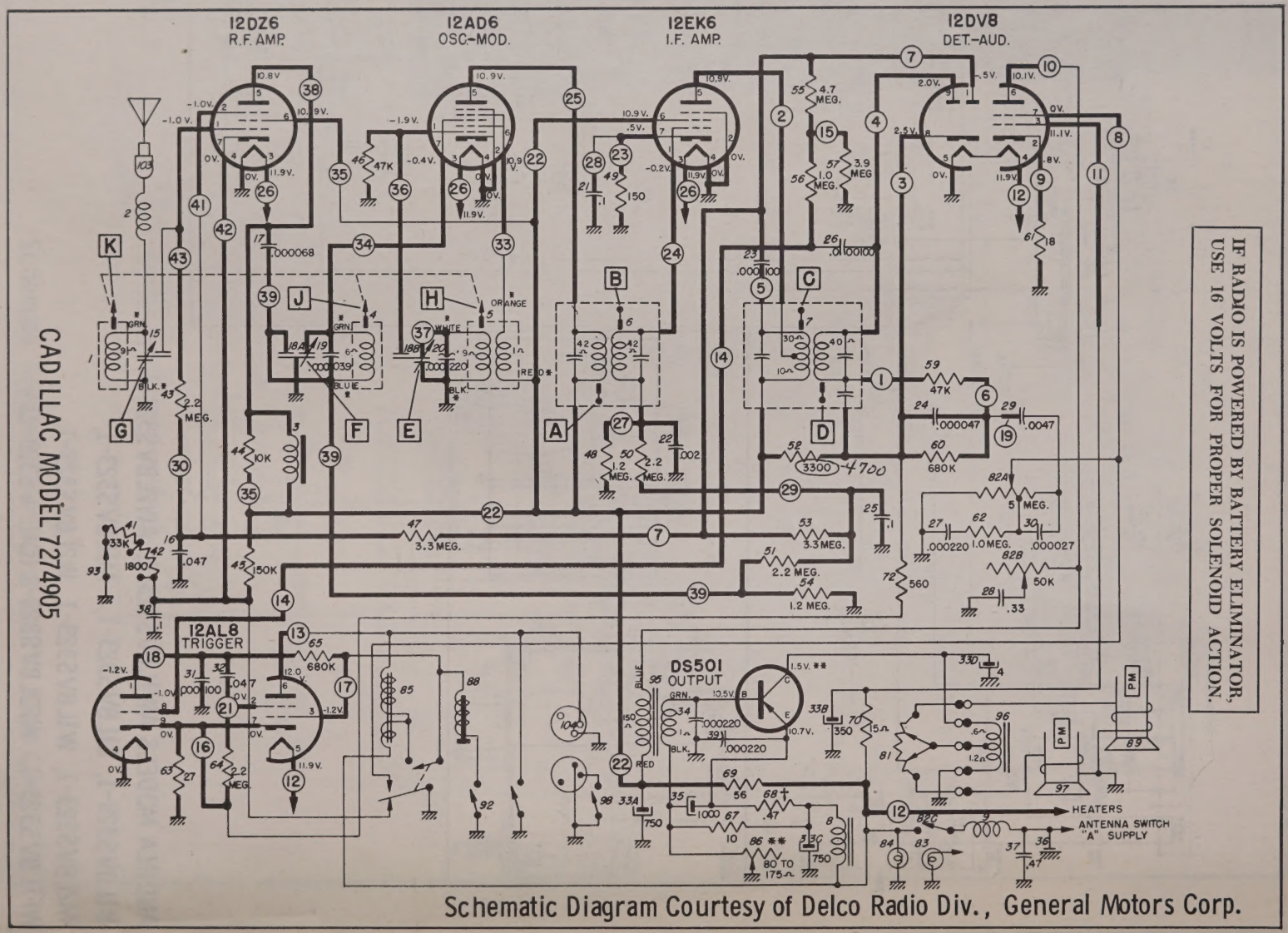
TOLERANCE ON VOLTAGES ± 10%

* – INDICATES LEAD FROM TUNER COIL ASS'Y.

** – BEFORE MEASURING TRANSISTOR VOLTAGES, THE SHORTING TYPE SPEAKER SOCKET MUST BE OPENED AND A 4 OHM SPEAKER CONNECTED. IF TRANSISTOR IS REPLACED, ADJUST BIAS POTENTIOMETER (ILLUS. 67) TO OBTAIN PROPER COLLECTOR VOLTAGE WITH 12 VOLTS INPUT TO RADIO.

+ – ILLUS. 57 IS A FUSE RESISTOR FOR THE TRANSISTOR.

Schematic Diagram Courtesy of Delco Radio Div., General Motors Corp.



CADILLAC MODEL 7274905

IF RADIO IS POWERED BY BATTERY ELIMINATOR, USE 16 VOLTS FOR PROPER SOLENOID ACTION.

Schematic Diagram Courtesy of Delco Radio Div., General Motors Corp.